AVIATION WEEK

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JUNE 20, 1949

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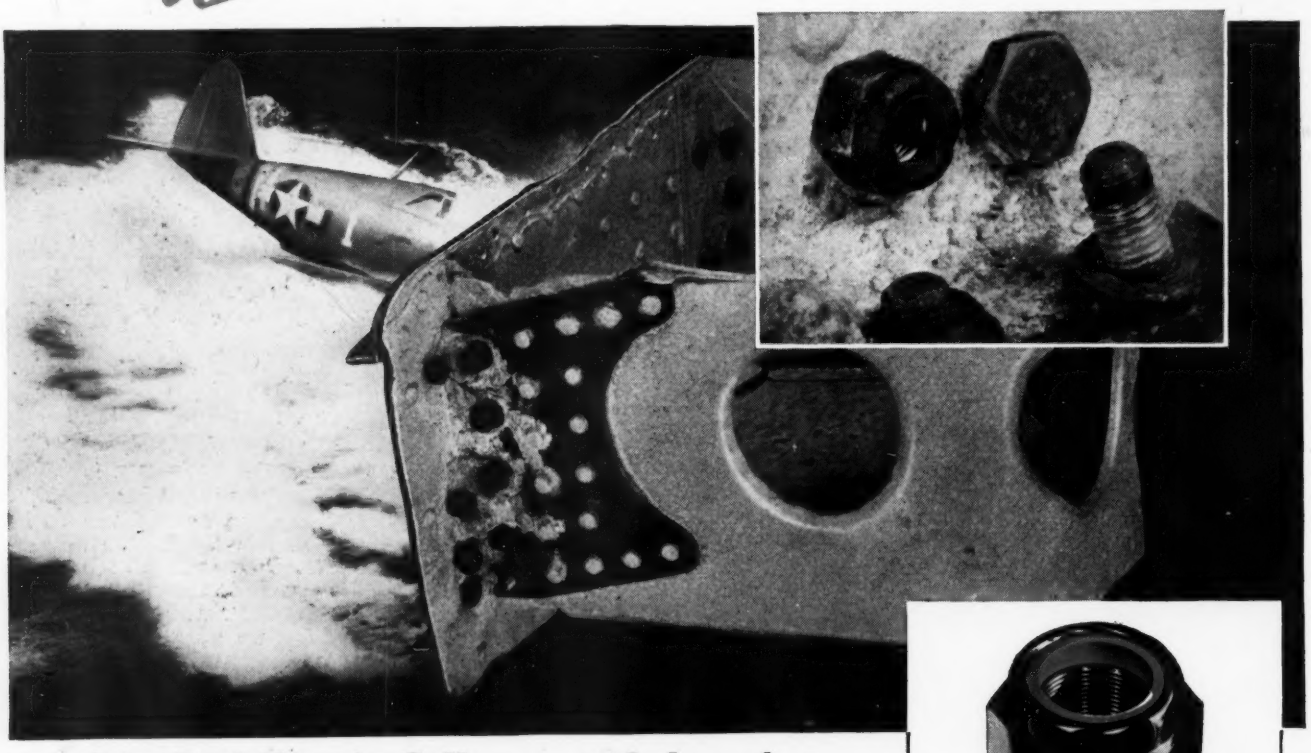
Grumman Panthers

The U. S. Navy's new jet fighter, the PANTHER is designed to operate from either carrier or land bases. In addition to being capable of highest speeds, the PANTHER possesses exceptional maneuverability. In design, construction, and outstanding performance characteristics, it is a worthy successor to those great fighters, the WILDCAT and the HELLCAT which, during the last war, won such distinction as dependable units of the Navy's gallant air arm.

GRUMMAN AIRCRAFT ENGINEERING CORPORATION, BETHPAGE, LONG ISLAND, NEW YORK

Contractors to the Armed Services

2½ YEARS *Under the Sea* BUT THE THREADS ARE STILL CLEAN



The Red Elastic Collar provided perfect protection against LIQUID SEEPAGE!

Wartime. A fighting plane crashed into the sea. 2½ years later, a salvage crew fished out the corroded tailpiece. The alloy frame was eaten away, but the ESNA fastened steel reinforcing piece was still intact. A wrench was applied, and the Elastic Stop Nut was removed with ease. Why? Study the unretouched photos. Note the bright, rust-free working threads. The self-sealing Red Elastic Collar prevented the liquid seepage that would cause an ordinary fastener to rust tight.

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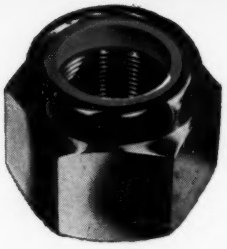

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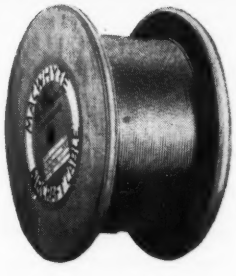

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This photograph suggests the wide variety in Macwhyte's comprehensive line of "Safe-Lock," "Socketype" and "Rigid" terminals, "Hi-Fatigue" Cable and Assemblies.

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You can rely on Macwhyte for uniform quality materials which conform to A-N specifications.

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Tie-Rods • Wire Rope • Braided Wire Rope Slings

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- Aircraft Spark Plug Connectors
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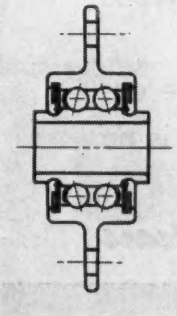

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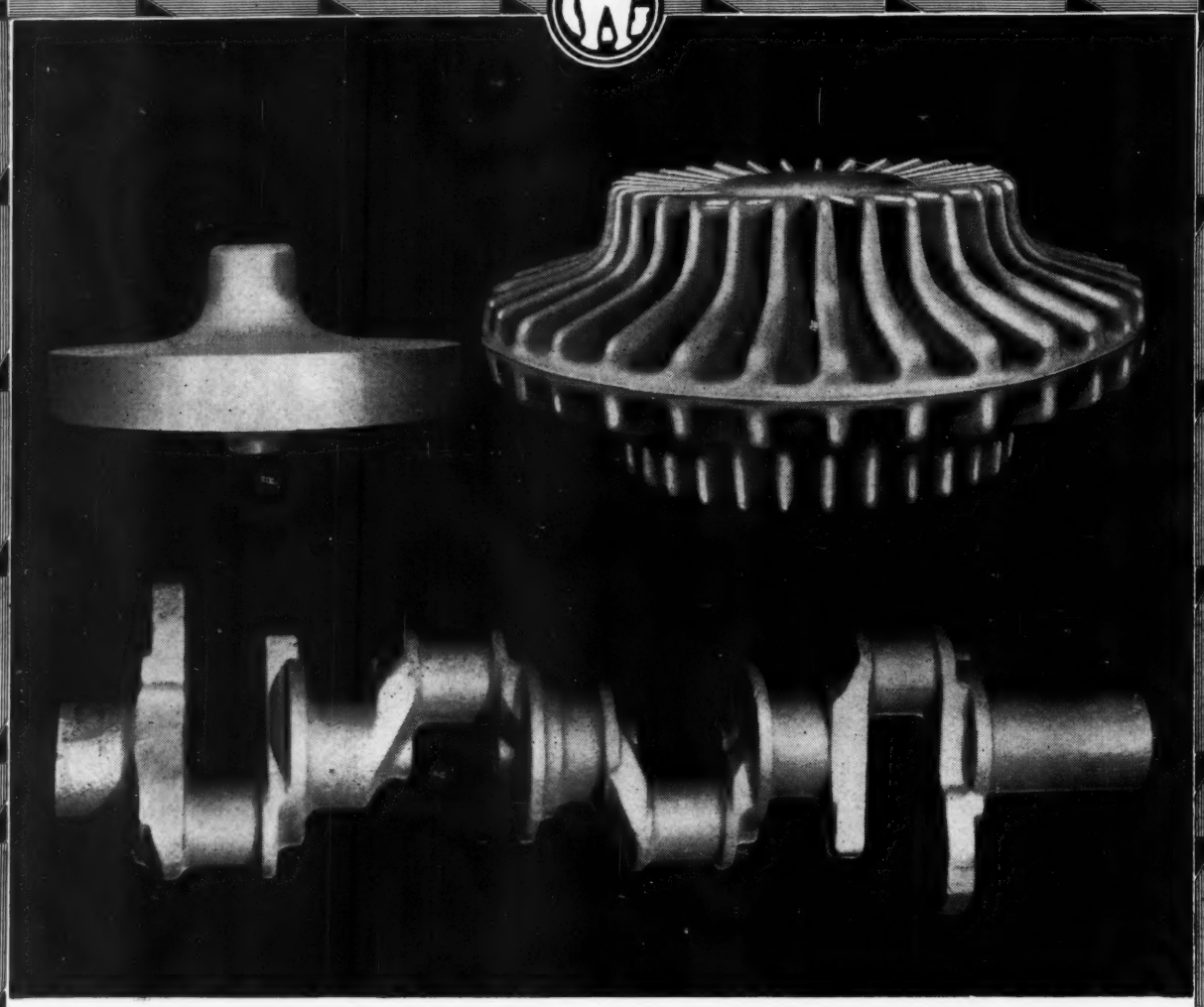

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Be it crankshafts and other vital forgings for the piston type engines or turbine wheels and impellers for turbo jets—there is no substitute for Wyman-Gordon experience.

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NEWS SIDELIGHTS

Congress Plans Cool

Congressional enthusiasm for legislation setting an authorized Air Force strength of 70 groups has cooled.

The measure was passed by the House in mid-March, but the Senate Armed Services Committee has evidenced little inclination to act on it at this session. Sen. Lyndon Johnson (D., Tex.), a member of the committee and one of the leading supporters of a strong air arm on Capitol Hill, commented:

"If we haven't the money to appropriate for a 70-Group program, it seems rather inconsequential as to whether or not one is authorized. It would be good as a yardstick with which we could measure our actual air strength."

This is a general attitude. In addition, some Congressional economists are antagonistic. They feel the 70-Group authorization would mean a perennial pressure for USAF appropriations too great for the Federal treasury to support.

Secretary of Defense Louis Johnson has given the 70-Group authorization bill fourth priority on bills pending before the Senate Armed Services Committee. Measures more vital to the armed services, he said, are: the pay raise bill; legislation authorizing a $623 million public works bill (projects totalling $430 million are planned for construction in the 1950 fiscal year); and legislation authorizing $311 million for wind-tunnels under the so-called "unitary plan" of the armed services and National Advisory Committee for Aeronautics.

Valuable Study

All pilots will be watching with interest for results of the Navy's study on the effects of stimulants on flying ability.

Six Navy enlisted men are being used as guinea pigs in the experiments being conducted by the Naval Medical Research Institute at Bethesda, Md. All flying is done in a Link trainer. Among the stimulants to be tested: alcohol, seasick pills, benzedrine and atabrine.

Air Games

U. S. Air Force will participate in joint maneuvers this summer over Europe with planes of four other countries. This will be the first official U. S. participation in the Western Defense Command (Britain, France, Holland and Belgium) despite the fact that the North Atlantic Pact will probably not have been ratified by the Senate when the games begin.

Boeing B-29s based in England and Lockheed F-80s from Germany are scheduled to maneuver over Europe next month and again in September.

Meanwhile, U. S. Air Force is screening war surplus aviation equipment now in War Assets Administration stocks for material to be used in the military aid program to Atlantic Pact nations.

Research Facts

Real significance of the supersonic flights of the Bell X-1, rocket powered research plane, according to NACA research director Dr. Hugh L. Dryden, are not in the high speeds (1100 mph. and Mach 1.5) recorded but in the quantitative data obtained on drag, stability, trim changes, and air loads at all speeds within the transonic range.

Dryden characterized the X-1 as obsolete as far as the design of modern transonic and supersonic airplanes are concerned. He pointed out that only a rocket motor could produce sufficient power to push the X-1 conventional configuration up to supersonic speed.

He indicated that other research planes in the joint NACA-USAF-Navy high speed flight research program would offer more efficient approaches to supersonic flight than the X-1.

Air Mail Promotion

Postmaster General Jesse Donaldson has been requested to draw up a $100,000 program to promote the air mail volume of feeder lines, by Sen. Lyndon Johnson (D., Tex.), a member of the Senate Interstate and Foreign Commerce Committee. Donaldson agrees with Johnson that this would be one painless way to reduce the department's air mail deficit.

Under the airplane-mile rates paid feeders, Post Office pays for considerable space it does not utilize. A boost in feeder air mail volume would give the department additional revenue, but involve no additional outlay in carrier payments. Johnson plans to push the program in Congress.

Advertisement of schedules, alone, Johnson predicts, would substantially increase feeder volumes. Many businesses, he reports, have turned sour on short-haul mailings by air because their mailings have just missed takeoffs and been delayed. Donaldson is defeatist about the program, pointing out that Congress has consistently clipped all appropriations for promotional campaigns.

ALPA Plum

Air Line Pilots Assn. is looking for an airline pilot to leave the cockpit for a $10,000 a year desk job as executive vice-president of ALPA and No. 2 man to President Dave Behncke.

ALPA voted the job at its convention last November in Chicago with orders that the post be filled within 60 days.

However, the group has been unable to persuade a senior pilot to take the pay cut a $10,000 job would mean if he went off flying status. ALPA wants the executive vice president to take some of the work load off Behncke and to put a pilot thoroughly familiar with modern airline operational problems on the executive staff.

Subsidy Fight

Senate Appropriations Committee, which has repeatedly called for separation of subsidy and service mail payments to the airlines over the past few years, is now irately determined to force the separation.

The committee clipped $16 million off the second deficiency appropriation bill for domestic airmail payments, despite testimony of Post Office officials that the department is now without funds to make payments to carriers for the remainder of this fiscal year.

Senate sustained the action in passing the measure. The $16 million estimate was not submitted to Congress until after the second deficiency bill had passed the House. Hence, for the time being the appropriation is out.

Sen. Burnet Maybank (D., S. C.), chairman of the Post Office appropriations subcommittee, told AVIATION WEEK that "if the Civil Aeronautics Board cannot separate subsidy and service airmail payments, then I am in favor of getting a new CAB that can." Maybank conceded that Congress ultimately "will probably have to" appropriate funds to make good on mail pay increase decisions by CAB.

AVIATION CALENDAR

June 20-24—Semi-annual meeting of the agency committee of the Air Transport Assn.

June 20-24—AIEE, summer general meeting, New Ocean House, Swmapscott, Mass.

June 26-27—NAA 27th annual national convention, Akron, Ohio.

June 27-29—Formal dedication of Naval Ordnance Laboratory aeroballistics devision, followed by five half-day technical sessions, White Oak, Silver Spring 19, Md.

June 27-July 1—1949 semi-annual meeting, American Society of Mechanical Engineers, University of California, Extension Bldg., 540 Powell St., San Francisco, Calif.

July 1-4—Third annual national convention and reunion Air Force Assn., Stevens Hotel, Chicago, Ill.

July 1-5—Florida State Air Tour.

July 2-10—National soaring contest, Harris Hill, Elmira, N. Y.

July 10-13—Annual meeting, Natl. Assn. of University Administrators of Aviation Education, Kent State University, Kent, Ohio.

July 21-22—IAS annual summer meeting, IAS Building, Los Angeles.

Aug. 6-14—1949 West Coast soaring championship, Palmdale Airport, Calif.

Sept. 1-7—International conference of Federation Aeronautique Internationale, Wade-Park Manor, Cleveland, Ohio.

Sept. 3-5—1949 National Air Races, Cleveland, Ohio.

Sept. 6-8—Annual spark plug and ignition conference, sponsored by Champion Spark Plug Co., Hotel Secor, Toledo, Ohio.

Sept. 7-11—10th Society of British Aircraft Constructors flying display and exhibition, Franborough Airfield, Hampshire, England.

Sept. 12—IATA fifth annual general meeting, The Hague.

Oct. 30-Nov. 2—Annual convention, National Assn. of State Aviation Officials, New Orleans.

Nov. 9-11—Seventh annual meeting, Aviation Distributors and Manufacturers Assn., French Lick Springs Hotel, French Lick, Ind.

Jan. 13-15, 1950—All-American Air Maneuvers, Miami.

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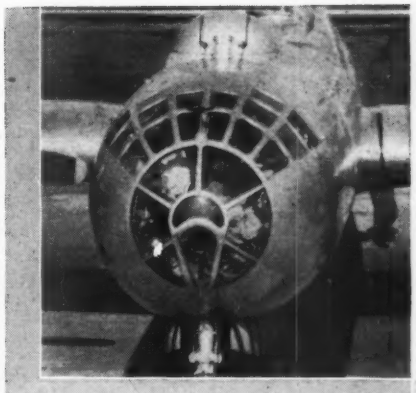
NEW requirements . . . for more adaptable transparent materials . . . for more advanced glazing methods . . . are a constant factor in aircraft production. Meeting those requirements—with new or improved products and new or improved techniques—is a constant factor in Pittsburgh's continuing aggressive development program.

On many types of military and large commercial planes you will find aircraft type Safety Glasses, transparent plastics, photographic glasses, precision bullet-resisting glasses and double-glazed Safety Glass, all developed by Pittsburgh.

In pilots' cockpits and bombers' compartments, new and different methods of joining multiple curved panels to each other and to the fuselage in a smooth flush mounting help aircraft designers to approach the aerodynamic ideal and also impart to the entire assembly rigidity and strength that more than meet the structural requirements.

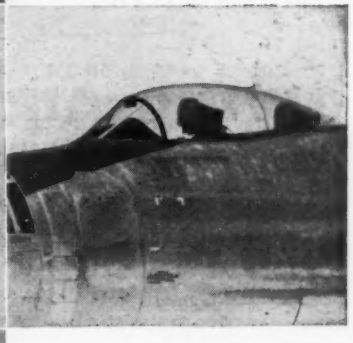
Our unequalled equipment and constant research—plus the "know how" of men who have devoted their lives to making quality glass—are at the disposal of all plane manufacturers, large and small.

When you are concerned with Safety Glass and glazing methods for airplanes, bring your problem to Pittsburgh. Pittsburgh Plate Glass Company, 2212-9 Grant Building, Pittsburgh 19, Pennsylvania.



The pilot's cockpit of the B-50 "Lucky Lady II" (above the circular nose) is glazed with Pittsburgh Safety Glass. It withstands the pressurized load and wide temperature variations. Since the glass is optically "perfect" the pilot has undistorted vision through panels even at extremely acute angles.

In the pressurized cockpit of the XB 45, the flat and curved panels of the windshield embody an entirely new development in airplane glazing. Made of a special type of Flexseal (laminated safety glass and plastic) originated by Pittsburgh, they are free from optical distortion, comparatively light in weight.



One of the toughest glazing problems ever encountered was the windshield of the Shooting Star. It was solved by Pittsburgh specialists, with center panel of bird-resisting, bullet-resisting Pittsburgh Safety Plate Glass.

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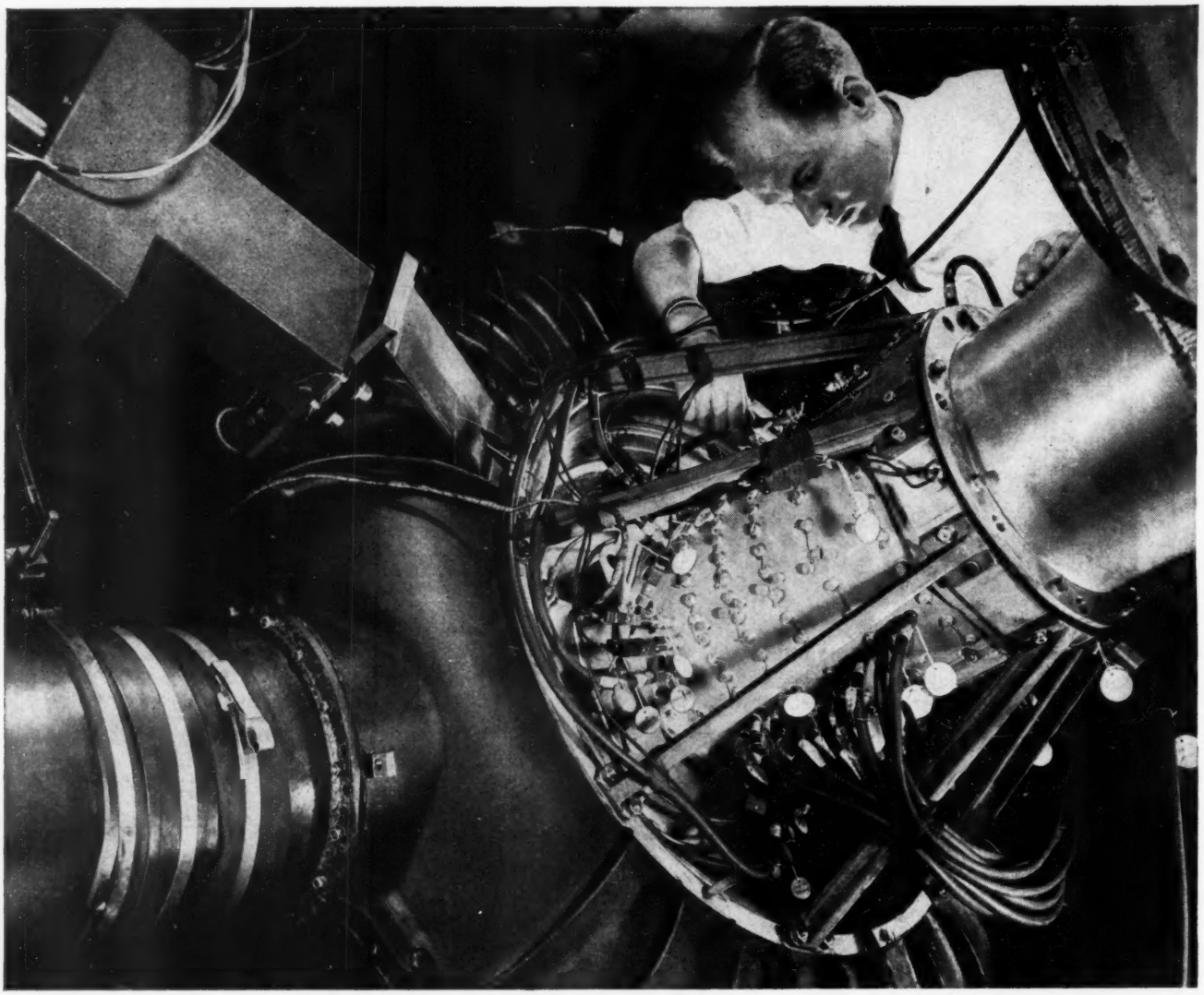


GIVING AIR THE NEEDLE

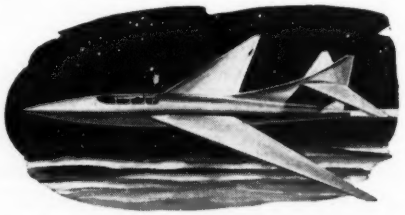
▸ This research engineer is literally "probing" the inside of an Axial Flow Compressor...for data that will enable Wright Aeronautical to design better compressor blades *today* for *tomorrow's* jet engines.

▸ Bristling porcupine fashion from the compressor on test are the sensitive probes. Inside each probe are four tiny hypodermic needles that measure the velocity, pitch and yaw angles of the air flow. These various measurements are taken *axially* along the length of the compressor, *radially* from the bases to the tips of the blades and *circumferentially* around the casing.

▸ From this data the Wright engineer determines the angle of attack, correct twist and airfoil contour of the blades in each stage of compression. Result? Improvement in compressor design to provide a considerable increase in the over-all efficiency and power output of new engines.

▸ Just as this research points toward better compressors, so the actual research technique involved results in greater laboratory efficiency. Many man hours and dollars are saved and far more accurate data is obtained.

▸ This investigation of every slight detail of compressor blade performance is typical of the aerodynamical research at Wright Aeronautical to produce better power plants for better aircraft today and in the future.



POWER FOR AIR PROGRESS

WRIGHT Aeronautical Corporation • Wood-Ridge, New Jersey

A DIVISION OF CURTISS WRIGHT FIRST IN FLIGHT

NEWS DIGEST

DOMESTIC

Douglas B-19, once world's largest landplane and used extensively by the Air Forces before and during World War II to test big-plane equipment and flying techniques, was scrapped at Davis-Monthan AFB, Ariz.

Dr. Karl T. Compton, chairman of the Research and Development Board, National Military Establishment, today announced the appointment of Dr. Clark B. Millikan as chairman and Fred A. Darwin as executive director of the board's committee on guided missiles.

About 1500 Bell Aircraft Corp. workers, members of the UAW-CIO, were out on strike last week after a twice-extended contract expired. At issue was a 15-cent hourly wage increase. More than 3000 employes were idled when the Buffalo plant ceased operation.

Sikorsky S-52-1 set a new world's helicopter altitude record of 21,220 ft. at Bridgeport, Conn. New record, achieved by Capt. Hubert D. Gaddis, Army Field Forces, supersedes 19,167 ft. by a Sikorsky R-5A, set in 1947.

Capt. E. Hamilton Lee, 57, a pioneer air mail and United Air Lines pilot, retired with more than 30 years and 4.4 million flying miles to his credit.

Tourist fares around South America, up to 25 percent below first class rates, were put into effect yesterday by Pan American and Panagra. Rates for area have not been established by IATA, which recently frowned on PAA's attempt to set up similar tariffs across North Atlantic. New service is said to be most comprehensive of its kind.

FINANCIAL

Aeronca Aircraft Corp. board of directors authorized an increase in the $1 per share stock from present 500,000 to 600,000 shares.

TEMCO reported earnings of $400,882 for four months ending Apr. 30 on sales of $4,826,402, as compared with profits of $60,807 on sales of $1,223,631 for same period last year. Directors have voted to place company's common stock on a quarterly dividend basis of 10 cents per share and have declared dividend of 20 cents per share for first two quarterly periods of 1949.

Helicopter Air Service, Inc., Chicago, proposes selling 80,000 shares of $4 par convertible class A stock.

Menasco Manufacturing Co. earnings for fiscal year ending 1949 may equal 25 to 30 cents per share, according to president Henry P. Nelson. Earnings for ten months ending Apr. 30 were 18 to 19 cents per share.

INDUSTRY OBSERVER

► Convair is now installing four General Electric J-47 turbojets in the jet pods on the prototype B-36D. Initial test flights of the pod job have been made with Allison J-35-19 turbojets rated at 4900 lb. but delivering as high as 5200 lb. static thrust. General Electric now guarantees 5200 lb. on the J-47 and is actually delivering as high as 5600 lb. of static thrust.

► American Airlines is studying a combination freight-passenger version of the Convair-Liner for a new type of air coach service. If Convair gets a USAF order for military cargo versions of the Convair-Liner, American may be able to buy a similar model at an attractive price, since engineering costs can be written off on the USAF contract. American's tentative plan is to operate low fare milk-run service with folding seats, filling space not used by passengers with freight. With full passenger load, this model Convair-Liner could seat 51.

► General Electric is dickering with a British engine manufacturer for U. S. rights to make a series of British turboprop engines. Progress in high speed propeller design plus slow solution of some turbojet problems on range and extremely high altitude operations are causing the military and a few transport manufacturers to take another long look at the turboprop. Not long ago both military and commercial equipment experts dismissed the turboprop on the grounds that solution to turbojet range and altitude problems was "just around the corner," that turboprop would be quickly outmoded. Navy has continued its turboprop development with the result that USAF will have to use Navy engines if and when it uses turboprops in its future long range bombers.

► Design of the sweptback wing on the Hawker P. 1052 fighter was accomplished without wind tunnel tests, one of the rare instances of a wholly experimental design approach in recent years. However, the straight-wing version had been flying for more than six months and the change to a swept-wing was considered a simple one by the design staff. The straight tail surfaces are retained, causing the initial occurrence of compressibility difficulties on the empennage, in direct contrast to the system used in the U. S. The Hawker P. 1052 recently averaged 618 mph. in a London-Paris flight.

► Boeing XB-47 six-jet bomber is equipped with rate-sensitive autopilot control to handle instability problems created by swept-wing and tail. This control, which reacts only to the rate at which instability occurs instead of the degree as in current autopilots, has proved an effective answer to the control of unstable aircraft. In the event of failure of the system, pilot's manual control is difficult since inherent stability of the plane requires excessive exertion to handle control forces. Air Force is now studying other swept-wing aircraft with stability problems with a view to use of the new autopilot system.

► Cook Cleland-Art Williams pusher midget racer (AVIATION WEEK May 23) is not expected to be completed in time for the Goodyear Races at Cleveland on the Labor Day weekend, but another Rochester, N. Y.-built pusher is expected to be ready for the Goodyear competition. Paul M. Shroeder, Jr., its builder, began to construct it over a year ago. The Cleland-Williams plane probably will make its first appearance at the Continental Races in Miami in January.

► Stripped-down Boeing B-29 of the Military Air Transport Air Weather Service reached an altitude of 48,562 ft. over the Pacific in the course of a special research project on atmospheric electricity.

► Convair's Delta Wing research plane Model 7002 has been accepted by the USAF and given the designation XF-92A. The Delta Wing experimental prototype will be turned back to Convair for further testing in connection with another Convair project for a high altitude Delta wing interceptor.

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AVIATION WEEK

June 20, 1949

New Tunnel Throat Aids Transonic Study

NACA develops large test section to remove research blind spot.

By Robert Hotz

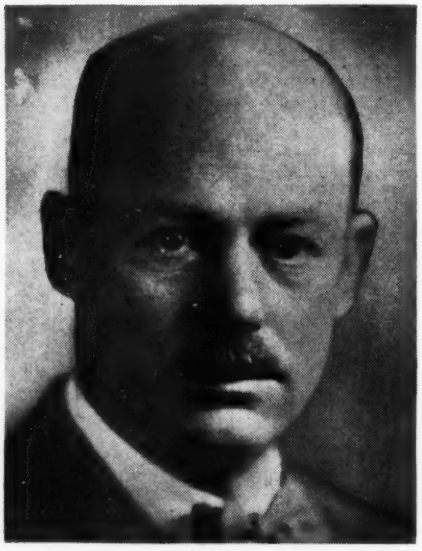
Development of a large scale transonic throat for wind tunnels by the National Advisory Committee for Aeronautics has eliminated a blind spot in wind tunnel research and paved the way for a more thorough exploration of this critical speed range.

The new transonic tunnel devices form a major item in the $55 million construction program now under way at four NACA laboratories. This program is aimed at providing new research facilities for the transonic speed range and extremely high altitudes.

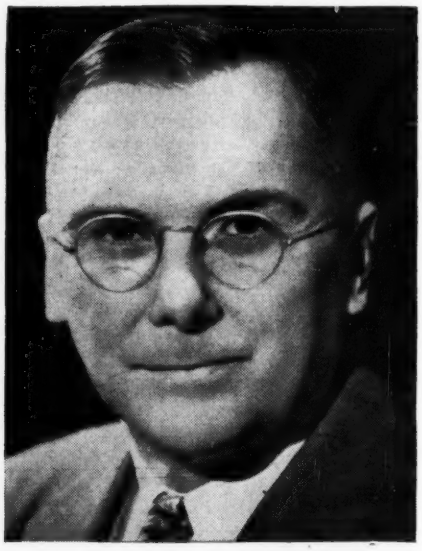
▶**Transonic Throat**—Details of the transonic throat and other devices used to achieve wind tunnel flow through the transonic range from Mach .9 to Mach 1.2 are a closely guarded research secret. However NACA budget hearing on Capitol Hill recently disclosed that a 16 ft. transonic throat is being installed in one of the Langley Field 16 ft. wind tunnels and a new 8 ft. transonic tunnel is also scheduled for construction there.

These new tunnels differ radically in construction and scope from the original NACA transonic tunnel developed at Langley by John Stack (AVIATION WEEK May 30). The Stack design permitted transonic research only with extremely small models and at low Reynolds numbers. Most critical need in this speed range is for accurate data on large models at high Reynolds numbers. NACA has discovered that use of small models at low Reynolds numbers in the past has indicated a much more rapid rise in the drag curve at lower speeds than have proved out in test of larger models or in flight tests.

▶**Blind Spot**—The former blind spot in wind tunnels through the transonic range was caused by the choking effect of shock waves in the tunnel throat. As a result of this blind spot, present transonic data is limited to that obtained by piloted research planes such as the X-1; rocket-propelled models; weighted models dropped from 35,000 ft., and by using bumps on aircraft wings to produce transonic flow over the bump with plane flying at subsonic speeds. These methods barely sketched the vague outlines of transonic zone problems.



Dr. Jerome C. Hunsaker



Dr. Hugh L. Dryden

Contrary to general opinion, based on highly censored versions of the X-1 supersonic flights, the real attack on the transonic zone is just beginning. Dr. Jerome C. Hunsaker, NACA chairman, emphasized the acute need for building up a stockpile of basic design data in transonic aerodynamics.

▶**Sonic Dives**—"All of our present aircraft can enter this region (transonic) in dives," according to Hunsaker. "New models of more refined design and increased power will encounter new problems for which design information is now lacking."

Dr. Hugh L. Dryden, NACA research director, indicated that the X-1 supersonic flights had whetted the aircraft industry's appetite to produce transonic military and commercial aircraft but left designers a long way from this goal.

Dr. Dryden pointed out that neither rocket power nor the X-1 design are suitable for tactically useful aircraft operating in the transonic range.

He said the military transonic plane would feature swept-wing designs producing far less drag than the X-1. All but special interceptor types would be powered by turbojet engines equipped with afterburners.

▶**X-1 Effect**—Dryden pointed out that early successful supersonic flights by the X-1 during the winter of 1947-48 had a marked psychological effect on the aircraft industry's designers.

"The general attitude of designers toward the transonic region was one of fear—the feeling that an airplane had to be equipped with air brakes so that if you were starting to enter the region you could get out of it by slowing down or else you should have rockets that enabled you to go through very quickly. But as soon as the designers began to see what the control forces on the airplane (X-1) were they immediately began thinking about ways of dealing with them and new vistas were opened not only for designing new aircraft but for improving performance of aircraft currently under development."

▶**New Planes**—Dryden indicated that new versions of the Boeing B-47 and B-52 bombers and North American F-86A fighter all aimed at transonic operations were in the design mill. Detailed results of the U.S. Air Force and NACA flight test program in the Bell X-1 were made available to the aircraft industry in May, 1948.

Immediately thereafter the industry requested NACA to create an ad hoc committee to plan a transonic research

program that would provide the data required by industry designers. With representatives of 16 aircraft manufacturers participating, this ad hoc committee, headed by L. E. Root of the Rand Corp., drew up a basic program of data desired and new research facilities needed to provide it. Basic request for new facilities included the transonic wind tunnels and a tripling in rocket-propelled model research at NACA's Wallops Island, Va., station.

▶ **Fund Fight**—NACA is seeking a $29 million construction appropriation for fiscal 1950 to continue the program begun with a $26 million appropriation approved by Congress last year. NACA asked for $15 million in cash, the bulk of which will be used to liquidate previous contract authority and $21 million in new contract authority for fiscal 1950.

House Appropriations Committee threw a block into the plans by slashing these figures to $10 million cash and $10 million in contract authority. House approved the cut endorsing the committee's view that all basic aerodynamic research had been done during the war period and it was now time to hold aviation research at its present level.

NACA has carried its fight for restoration to the Senate.

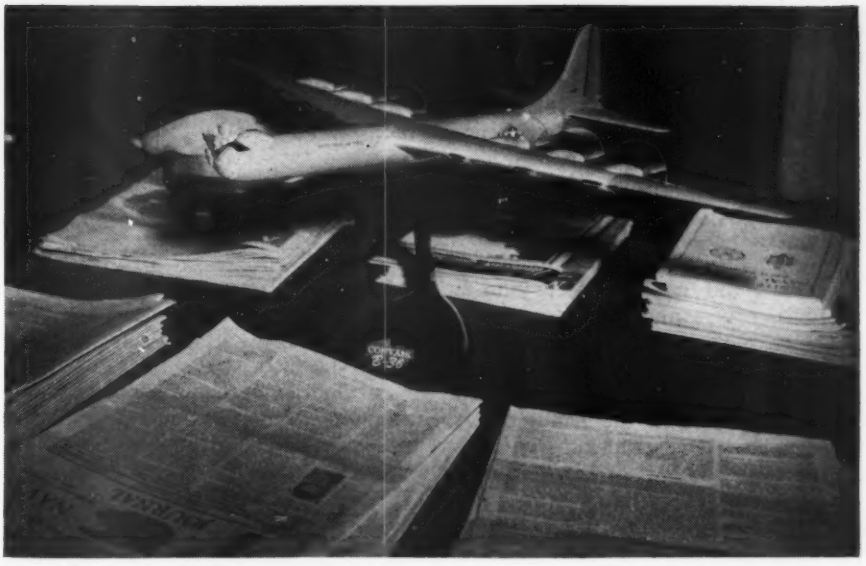
Airlines May Buy WAA-Leased Planes

Airline purchase of approximately 130 DC-3s and DC-4s currently leased from War Assets Administration is in preliminary negotiation stage at Washington.

A first exploratory meeting held last week between representatives of WAA, Air Transport Association, and some of the individual airlines leasing planes will be followed by a second session soon.

Three largest lessors of WAA-owned planes are TWA, United and Eastern, each holding more than 20, but the list of other companies leasing planes includes Colonial, Delta, Hawaiian Airlines, Mid-Continent, Northwest, Pan American, Capital, TACA, and Western. Leases on some of the planes expire in March, 1950, and others shortly thereafter.

WAA officials are frankly seeking to get out of the leasing business, and dispose of remaining transport planes as a part of the general liquidation of WAA holdings. They initiated the discussions with the leasing companies. Most of the airlines have indicated an interest in purchasing equipment currently leased, providing a reasonable price can be agreed upon. Indications are that WAA will not drive too hard a bargain, since pressure is on from the Executive department to get the agency out of the airline business as soon as possible.



CONSTANT REMINDER of what stirred up the investigation he shortly will head is this B-36 model on the desk of House Armed Services Committee Chairman Carl Vinson.

Air Strategy Probe Set For July

House authorizes $50,000 for investigation and counsel; Defense Secretary's control bill is temporarily shelved.

The forthcoming comprehensive investigation of B-36 procurement and air strategy by the House Armed Services Committee has shelved temporarily —and perhaps permanently—legislation strengthening Defense Secretary Louis Johnson's control over the services.

The investigation, touched off by a much-publicized speech by Rep. Van Zandt (R., Pa.), started out as a probe into the Air Force's B-36 procurement program "and collateral matters." Investigation has now been broadened to include virtually all aspects of air strategy (AVIATION WEEK, June 13), and will probably lead to a showdown between Naval carrier-based aviation and USAF long-range strategic airpower.

▶ **Probe Scope**—The committee has unanimously voted to cover the following points in its investigation—now expected to get underway after July 4 holiday.

1. **Was the decision** to cancel the Navy's 65,000-ton super carrier, United States, "sound"? Last year, a House armed services subcommittee, headed by former Rep. William Hess (D., Ohio), after a series of secret meetings, endorsed the carrier, and gave the Appropriations Committee approval to allow funds for it. Van Zandt was a member of the subcommittee. Congress provided $9 million for the carrier for this fiscal year, and the House allowed $43 million for it for the coming fiscal year. This was before Johnson's unanticipated cancellation of construction. The 1950 fiscal year armed services appropriation bill is now before the Senate Appropriations Committee.

2. **Is USAF putting too much** emphasis on strategic bombing and neglecting tactical aviation—air support of ground forces?

3. **Should two** of the armed forces be able to "pass on" the weapons of a third by a two-to-one vote in the Joint Chiefs of Staff? This will hit at the decision to cancel the carrier. It was carried by the vote of the Army and Air Force.

4. **Establish the truth** or falsity of all charges reported by Van Zandt (AVIATION WEEK, June 6).

5. **Locate and identify** the sources from which the charges, rumors and innuendoes have come. There have been counter charges that they originated from Navy ranks and steel contractors).

6. **Examine the performance** characteristics of the B-36 bomber to determine whether it is a satisfactory weapon.

7. **Examine the roles and missions** of USAF and the Navy (especially Naval Aviation and Marine aviation).

▶ **House Approval**—The House has approved a resolution authorizing $50,000 for the probe and providing for a special counsel to direct it. In two weeks of conferences, top members of House Armed Services Committee have failed to reach a decision on selection of the counsel. When Vinson called on Attorney General Tom Clark for a recommendation, Republicans let out a cry of "politics." Vinson repeated that the decision on the counsel would be by members of his committee.

Meanwhile, Vinson announced his

opposition to the unification legislation augmenting Johnson's control over Army, Navy and USAF. Johnson has estimated that the measure would make possible a saving of between $1 and $1.5 billion in the annual military budget through consolidations of activities between the services. It was approved by the Senate, the only opposition coming from Senators who objected because it did not empower Johnson to transfer personnel and the combat missions of the services.

Vinson countered that the measure would be "expensive" and "would put too much power in the hands of the Defense Secretary." Previously, Vinson had assured members of his committee of hearings on the measure to afford an opportunity to query Johnson on the carrier cancellation. After the B-36 probe was approved Vinson cancelled plans for hearings on the unification measure.

Idlewild Dispute Goes Back To Court

A sharp and bitter break in negotiations between eight major airlines and the Port of New York Authority has shifted the year-long controversy over New York International Airport back to the New York Supreme Court.

There was no hint that either side had brought forward any concessions or compromises acceptable to the other; in fact, when the meetings adjourned last week after a final 90-minute session, statements from both sides were in sharp conflict.

▶ **Blame**—The carriers—American, AOA, Capital, Eastern, Northwest, Pan American, TWA and United—claimed through their attorney George W. Whiteside that an "inflexible stand by the Port Authority" caused the collapse of negotiations which began Jan. 25.

Howard S. Cullman, chairman of the Port Authority and a participant in the sessions, claimed the meeting broke up when the airline presidents refused to "even read or consider the Port Authority proposals with respect to the payment of landing fees on the basis of actual costs." Whiteside denied this.

▶ **Liability**—This big issue faces Justice Thomas J. Cuff when he resumes hearings: Can the Port of New York Authority be sued?

In their list of "concessions and compromises" the airlines included a stipulation that the Port Authority sponsor and actively support legislation which "would make it possible for the airlines to do business . . . on terms enforceable by both landlord and tenants . . ." Port Authority spokesmen indicated they were willing if satisfactory agreement had been reached with the airlines.

▶ **Tariffs**—The airlines' desire for fixed tariff schedules, is still stumbling block in negotiations, although the carriers did some backtracking. Previously, the airlines wanted tariffs frozen for a period of ten years, but later changed the time to five years. The Port Authority, maintaining that landing and other fees must fluctuate with labor and other costs, called such a binding agreement "unworkable."

Meanwhile, carriers still have functioning contracts at LaGuardia and Newark Airports. Pan American Stratocruisers are using Idlewild for overseas flights under the 1945 contract originally made with the city of New York. Supreme Court Justice Cuff, who had initiated attempts to effect an out-of-court settlement, now has the case thrown back in his lap, and other major airport operators throughout the country who may be contemplating tariff changes or new contracts, are anxiously awaiting Cuff's decision.

Union Election Due At Chance Vought

A long-pending union election at Chance Vought's Dallas plant to decide whether the International Assn. of Machinists or the United Automobile Workers represents hourly production, maintenance and inspection employes, may be ordered soon by the National Labor Relations Board.

Two other unions also will be involved in the election: International Brotherhood of Electrical Workers, AFL, which wants to organize power house employes and maintenance electricians; and the Amalgamated Lithographers of America, CIO, which seeks to organize lithographers.

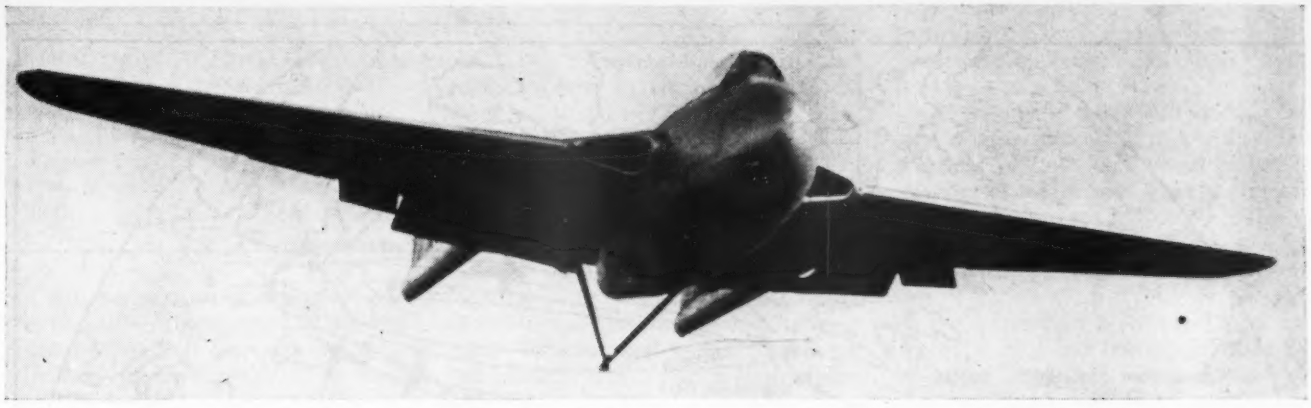
Previous attempts by the unions to force an election were countered by Chance Vought management, which claimed there were too few employes in the Texas plant to permit an authoritative election. Company officials in March, when employment was low, estimated the plant eventually would employ 5000 hourly workers.

The UAW filed the original petition with NLRB. Earlier in May, a UAW-inspired motorcade of 200 Chance Vought workers showed up at NLRB regional offices in Fort Worth with a petition said to bear 2500 employes' signatures urging an immediate election.

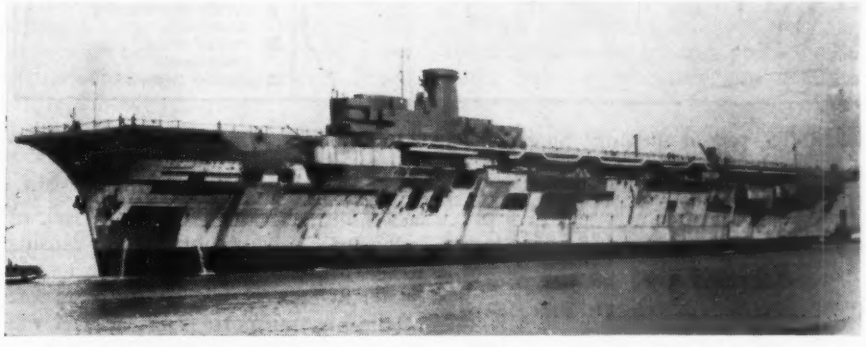
Recently, an unfair labor practice charge against Chance Vought over the firing of a worker last December was dismissed by an NLRB trial examiner. The examiner ruled that Pierre Rossini, an IAM official, had not been discharged for union activities.

MARTIN SUB HUNTER TAKES OFF

Unusual take-off shot of the Glenn L. Martin Co. Mercator (P4M) showing air intakes open for use of jet engines in addition to two piston engines. First production model of Mercator is now going down the Martin line at Baltimore. Navy has ordered 19 aircraft of this type which are to be placed in operation as anti-submarine warfare patrol planes.



WITHOUT LANDING GEAR, tail hook dangling, Sea Vampire lands on rubber mat placed on carrier deck. This method, plus . . .



. . . EAGLE-class carrier are British hope to extend the naval use of jet aircraft.

Britain Builds Up Naval Aviation

Steady development program being pushed, although new carriers still smaller, slower than those of U. S.

(*McGraw-Hill World News*)

LONDON—While the United States has scrapped its aircraft carrier building program, Britain is proceeding with a slow but steady development of its carrier-based naval aviation.

British naval aviation still has a long way to go to catch up with U.S. carriers now in service. Largest of the British carriers are the Eagle and Ark Royal in the 37,000 ton class. These compare with the three U.S. carriers of the 45,000-ton Midway class and the 65,000 tons of the abandoned super-carrier prototype.

▶ **Eagle Launched**—Eagle was recently launched and will be commissioned before the end of the year. Ark Royal is still building at Birkenhead and is not expected in service before 1952. This class of British carrier is 803 ft. long with a maximum beam of 112 ft. Main anti-aircraft armament is 16 4.5-inch guns in addition to 61 others of smaller caliber.

Speed is expected to be better than the 32 knots of the fleet carriers now in service.

U. S. Midway-class carriers have a top speed of 35 knots, are 986 ft. long and carry a complement of 100 airplanes.

Size of latest British carrier plane groups will not be determined until after they go into service but it will probably not be more than 80 planes apiece.

▶ **Modify Carrier**—Of the seven 23,000-ton British carriers only one, the Implacable, is now in service. Two others are used for training; two in reserve and two, the Formidable and Indefatigable are undergoing modification to handle the latest types of jet aircraft.

This type of carrier compares with the U.S. 27,000-ton Essex class of which the U.S. Navy now operates eight with a reduction to five scheduled after July 1, 1949.

Essex class carriers handle 80 plane groups and have a speed matching the 32 knots of the British medium aircraft carriers.

The British now have four light carriers (25 knots) in fleet service with two more on special experimental anti-submarine warfare duty. Eight of this class were under construction but work on three has been suspended indefinitely. These are roughly comparable to the U.S. "Jeep" or escort carriers.

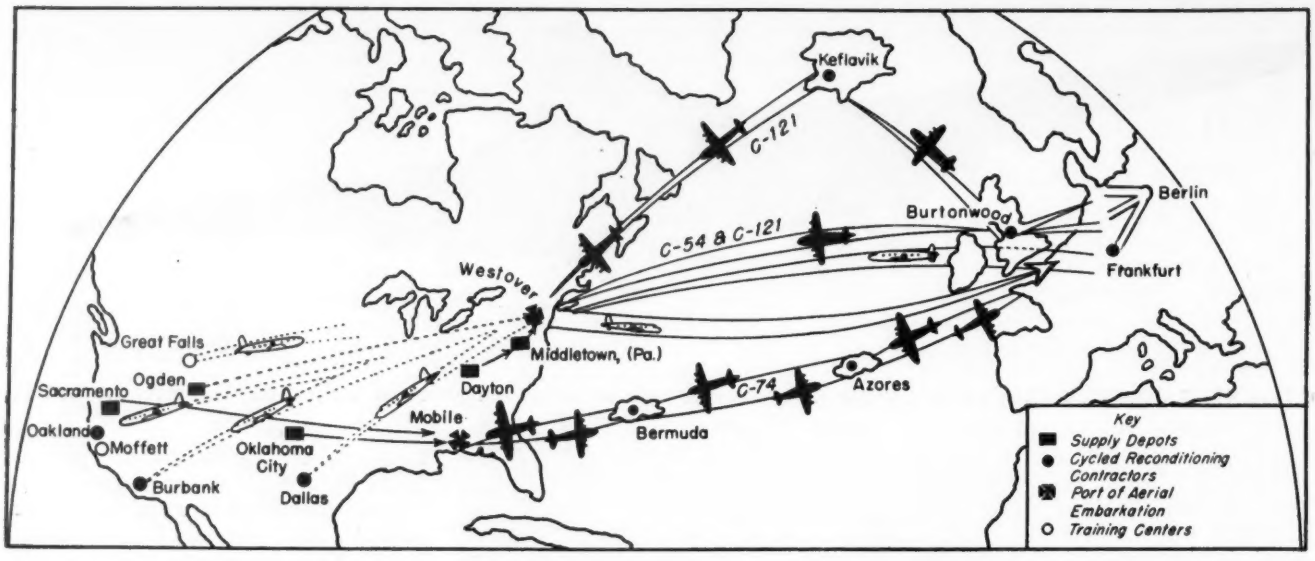
▶ **Speed Critical**—There has been some criticism that current British carrier types are not fast enough to launch and land the latest jet fighters that are now coming into service. British official sources claim that even the light carriers are adequate for jet aircraft. U. S. experience has been that its latest operational jet fighters, the Banshee (F2H) and Panther (F9F) can land on a carrier deck but that they require catapults for take-off.

There has been considerable experimental work done in Britain on new types of carrier-based planes but only one jet fighter, a naval version of the Vickers-Armstrong Supermarine Attacker has been ordered in quantity for carrier use. An experimental quantity of de Havilland Sea Vampires, a naval version of the standard RAF fighter, have been flown off carriers.

▶ **Rubber Deck**—These Sea Vampires have been used in experimental carrier operations without conventional landing gear (see photo). A rubber landing mat is laid on the flight deck. When the Sea Vampire engages its tail hook it flops down hard on the rubber mat. Belly structure of the plane has to be reinforced for this type of landing but so far no structural failures have been encountered. Some increase in aircraft performance results since carrier-based planes require extremely heavy landing gear to take the shock of arrested landing on the carrier deck.

▶ **Carrier Doctrine**—The new Hawker N7 46 jet fighter was originally designed for the British Navy but has not been ordered into production. A swept-wing version of the Hawker fighter is now flying.

British carrier doctrine is still to operate as fleet support. So far there has been no evidence of the development of a British naval policy of using carrier task forces as an element of strategic bombardment, similar to the U.S. Navy doctrine that has been the source of so much controversy between the U.S. air Force and Navy.



TWO CONTINENTS linked by ocean comprise MATS' part of the airlift: Supply and overhaul in the U. S., the actual lift in Europe.

Airlift Goes On To New Records

MATS not planning to reduce scope of operation, and is piling up experience in use of bigger plane types.

Berlin airlift is operating at full capacity despite the official lifting of the Russian blockade on May 12.

U. S. Air Force planes delivered a record lift of 192,309 tons to Berlin in May for a daily average of 6203 tons.

▶ **High Tonnage**—In the first 29 days since the May 12 blockade lifting, the U. S. portion of the airlift has delivered 161,875 tons for a daily average of 5580 tons. Royal Air Force has delivered an additional 51,897 tons during this period for a total airlift of 213,772 tons. Total cost of the U. S. lift up to June 9 was estimated at $198,235,100 by the U. S. Air Force.

Main reason for the full-scale continuance of the airlift has been a strike of railroad workers in the Russian zone that has blocked rail traffic into the western zone of Berlin controlled by the British, French and Americans. Surface transportation is still limited to a few barges.

▶ **Ease Weather**—Observers recently returned from Germany indicated that the only outward sign of the blockade lifting on the airlift is a slight raising of weather minimums at airlift terminals. There are no plans at present to reduce the scope of the airlift and the airlift task force in Germany is operating on the basis that the airlift will be continued indefinitely. Task force officials indicate that the present C-54 fleet with replacements available from MATS would last through another winter of intensive operations but would require major replacements in the spring of 1950. The lift is currently operating an average of about 235 C-54s a day with another 100 in the pipeline and maintenance bases.

Attrition rate on the C-54s now averages from one to three per week and is mounting steadily over earlier averages. Most of the washouts are due to nonfatal accidents that result in major aircraft damage.

▶ **Engine Trouble**—Meanwhile investigation into the emergency landing of the Boeing YC-97A at Gatow Airport last month attributed cause to lack of sufficient valve lubrication causing rocker arms to fracture and the loss of power in two engines on the same side of the big transport. The YC-97A was carrying a payload of 40,000 lb. of baby food when the power failures occurred.

Landing was made on two engines during a heavy rainstorm on Gatow's longer runway. Tires burned out during heavy braking on the landing roll causing some damage to nacelles from wheel particles and tearing up part of the steel landing mat. The YC-97A was back in service three days after the landing.

▶ **YC-97A Test**—It has now delivered over a million pounds to Berlin and is being operated on an experimental round-the-clock 30-day test to gather operational data on intensive use of this type transport. Previously a Douglas C-74 had been given a similar test operation on the airlift.

Boeing reports the YC-97A has been operating at take-off gross of 135,000 lb. and landing weight of 130,000 lb. In regular operations with 40,000 lb. payload, YC-97A has been using only 3500 of the 5300 ft. Tempelhof runway for landing. No brakes are used in normal landing, all deceleration being accomplished by reversing propeller pitch.

Aircraft Employment To Remain High

Employment in the aircraft industry continues to rise slowly. It will level off during the next few months, and drop slightly while manufacturers await orders out of the military's appropriation for the next fiscal year.

But business will be good enough "for some time" to keep aircraft employment at a high level.

That is the way the U. S. Employment Service sees the job situation in the aircraft industry. Because its views are based on reports from 56 aircraft plants employing 90 percent of the industry's workers, they reflect to a large extent how the industry sizes up the business situation and outlook.

▶ **USES Picture**—Here's the picture USES gives on aircraft jobs. Expansion of employment has run its course. Yet, reporting plants indicate total jobs will rise about 2000 from June to August, reaching a total of 232,000. February's total was 226,300.

While employment will remain high, how high will depend on military appropriations for fiscal 1950. New funds available after July 1 won't begin to show up in jobs and production until winter. Manufacturers expect to cut the number of jobs by a few hundred between August and October. This is

	Number of Plants	Employment Feb.	April	Expected Employment June	Aug.	Oct.
Total Aircraft	56	226,300	228,800	230,400	232,400	232,100
Complete Assembly..	32	168,300	170,000	171,000	172,100	171,200
Engine	8	34,000	34,300	34,400	34,700	35,400
Propeller	3	7400	7600	7800	7900	7900
Parts	13	16,500	16,800	17,100	17,400	17,500

due to uneasiness about future orders.

▶ **Some Cuts**—Although the overall employment trend has been upward, many individual plants have had to make deep cuts because of cancellations and shifts in military orders, which account for 95 percent of the industry's business. Of 32 assembly plants which report to USES, eleven cut their payrolls between February and April and many of them anticipated further cuts. Seven of the 24 engine, propeller and parts plants made minor reductions in their working force in the same period.

Fifteen plants expect to cut their working force before October, although a net increase of 3300 jobs for all 54 plants is forecast during the six months ending in October.

▶ **Labor Plentiful**—Labor supply is plentiful in most places, so that nearly all out-of-area recruitment has stopped, except for engineers and highly-skilled technicians. This situation has enabled aircraft manufacturers to raise their hiring standards and be more selective. Fewer women are being hired in the shop.

With experienced workers available, there has been no training problem. In-plant training programs now concentrate on developing better supervision. A few plants are having minor difficulty training radar technicians.

▶ **Industry Report**—Reports made by aircraft plants in April indicated their employment in February and April and the working force they thought they would need in June, August and October.

Fairchild's Director Candidates Named

Sherman Fairchild's Committee of Stockholders last week was soliciting proxies from more than 10,000 owners of Fairchild Engine & Airplane Corp. shares for the Fairchild faction's slate of directors.

It includes:

• **Richard S. Boutelle**, general manager of the Aircraft division, a vice president and director of the corporation, who had been relieved of duties by current management (AVIATION WEEK, June 13). He owns 300 shares.

• **Arthur Flood**, comptroller of the Aircraft division, also relieved of duties when he signified his willingness to appear on the slate. He owns 200 shares.

• **Grover Loening**, member of the Committee of Stockholders, and recent consultant to the President's Air Policy Commission. He owns 5000 shares.

• **Sherman M. Fairchild**, chairman of the board of Fairchild Camera and Instrument Corp., and leader of the movement opposing J. Carlton Ward, Jr. He owns 95,670 shares.

Others on the slate, with stock holdings in parentheses, are J. A. Allis, vice president of the Grace National Bank, member of the present Fairchild board (1000); E. Ainsworth Eyre, a director of W. R. Grace & Co. (1700); A. L. Baker, vice president and general manager of Kellex Corp. (100); L. M. W. Bolton, partner in Bolton & Lucas, industrial consultants (6100); William D. McIntyre, executive vice president of Monroe Auto Equipment Corp. (500); Frank R. Nichols, president of Nichols Wire & Aluminum Co. (1000); and Charles H. Colvin, vice president of G. M. Giannini & Co., Inc. (200).

▶ **Point Of Attack**—The committee which represents 124,100 shares told stockholders in a letter that defeating the Ward group will not disturb "the money-making part of the business" and will not affect "the thousands of loyal employees who are anxious to contribute to the corporation." Said the letter: "We are proposing a skilled team to replace the present one-man dominated management!"

Included with the letter was a proxy form and a 24-page booklet, stating what the Fairchild faction believed to be the issues, and a seven-point program:

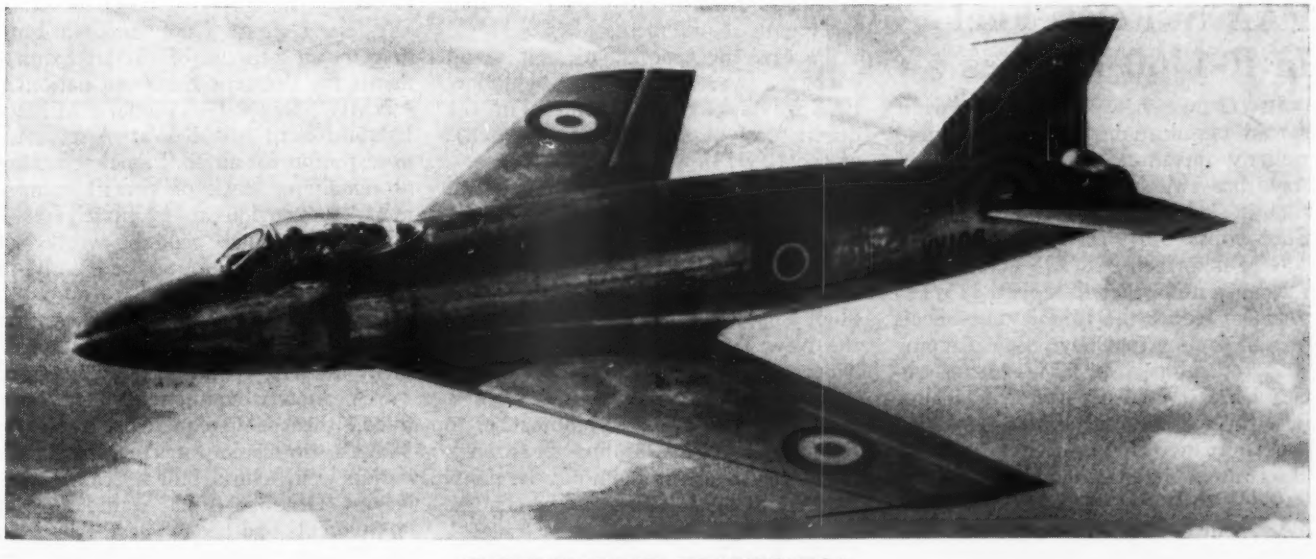
• **Relieve the corporation** of the burden of the Ward contract.

• **Make no long-term** profit-sharing or retirement arrangements with any officer except with stockholder approval.

• **Move annual meetings** from Hagerstown, Md., to New York City.

• **Give stockholders** a larger share of the corporation earnings.

• **Concentrate top management** at the



SUPERMARINE TRANSONICS

This is the first flight photograph of Vickers-Armstrong's Supermarine experimental fighter—the 510—developed from the Attacker, which is notable in having sweepback on all surfaces. It is powered by a Rolls-Royce Nene turbojet of 5000 lb. static thrust and should be capable of performing at high Mach numbers. Bulge over tailpipe probably houses anti-spin parachute.

CAPITAL'S EMERGENCY OXYGEN MASKS

To protect pilots against effects of carbon dioxide concentrations that may form in forward compartments of its DC-4s during operation of the nose heater fire extinguishing system, Capital Airlines has equipped these planes with emergency oxygen masks. Independent of the plane's standard oxygen system, the demand-type regulators are plugged into outlets on the control panel (left). A development of Mine Safety Appliances Co., Pittsburgh, the masks are airtight and afford respiratory protection as well as prevent CO_2 from reaching the eyes. A portable demand-type oxygen mask that enables the wearer to walk around in atmosphere containing high concentrations of carbon dioxide or other contaminants is shown at right.

plants where profits are made.

• **End one-man domination** of the company and encourage team spirit in management.

• **Look into possibilities** of extending corporation activities within the aircraft industry and into other fields.

Whether Sherman Fairchild can muster enough support through proxy statements to oust current corporation management will be known July 6 when the annual stockholders meeting takes place. It has been postponed twice.

PAA Switches Fuel In R-4360 Engines

In a change that likely will have widespread ramifications in both civil and military operations, Pan American Airways has switched to a lower octane fuel in its Pratt & Whitney R-4360 Stratocruiser engines.

The new fuel, 108/135 octane (performance number) will replace 115/145 grade to reduce the troublesome effects of lead fouling that have been plaguing many operators. The 115/145 fuel carries 4.6cc. of lead per gallon, as against 3cc. for the 108/135 gas.

▶ **Performance Factors**—P&W has given its consent to use the lower octane gasoline following tests by P&W and PAA, which have shown that the fuel meets the necessary requirements.

Octane numbers are predicated on the CFR (cooperative fuel research) engine, and it's likely P&W has found that the two grades of fuel give approximately the same performance in the R-4360 under the conditions of PAA operation.

▶ **Economy Supply**—Price of the 108/135 gasoline will not be less than the higher octane grade. This is because of the additional handling charges incurred by refiners, who will still be supplying the 115/145 octane fuel to the military.

Presumably the military, too, have experienced lead-fouling difficulties, and it would seem logical for the services also to adopt the lower octane fuel, provided performance characteristics meet with requirements.

To ease the problem of supply and pave the way for a price reduction, PAA may approach the military on the question of standardizing on the use of the 108/135 octane fuel.

Major marketers to PAA of the 108/135 fuel probably will be Esso Standard Oil Co. for overseas operations; Standard Oil Co. of California for West Coast and Honolulu activities; and Shell Oil Co. for all requirements in the New York area. Texas will supply American Overseas when the latter gets its Stratocruisers.

▶ **Other Methods**—Other approaches to the problem of lead fouling are through use of scavenger compound in the Ethyl fluid component of fuel and by changes in sparkplug design.

The British are reported to be attacking the problem via the latter method and have accomplished some degree of success with plug design understood to afford scavenging through configuration and volume of the space surrounding the center electrode.

Aircraft Surplus

Earmarking of approximately $100 million in aircraft components from WAA surplus stocks to be used as defense aid to Western Europe is expected if the Senate ratifies the North Atlantic defense pact.

In anticipation of Senate approval Air Force representatives are starting preliminary consultations with Marshal Bernard Montgomery, chief of staff, Western Defense Command, in London, on an estimate of aircraft requirements for Western European nations.

▶ **NME Request**—National Military Establishment asked War Assets Administration for an additional screening of remaining stock of aircraft components to provide approximately $100 million (original value) worth of equipment for European aid early in June.

Coming after an earlier notification from the National Military Establishment in May, that its requirements of WAA aircraft components had been filled, the new request has thrown WAA's timetable for complete liquidation well behind schedule.

▶ **New Deadline**—Final liquidation of components had been expected by June 30. However the new requirement has resulted in postponement of complete aircraft components liquidation by WAA or a successor agency, probably until June 30, 1950.

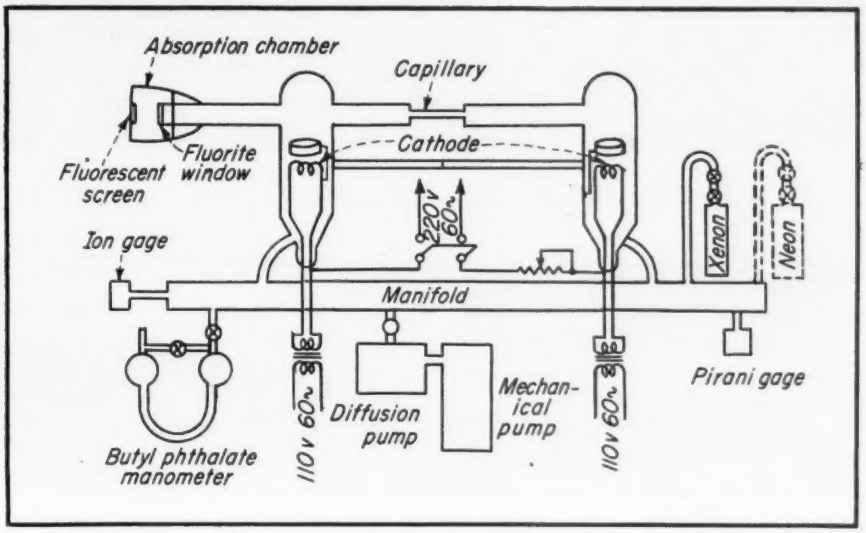


Fig. 1. Oxygen absorption research apparatus for flow visualization (Ref. 5).

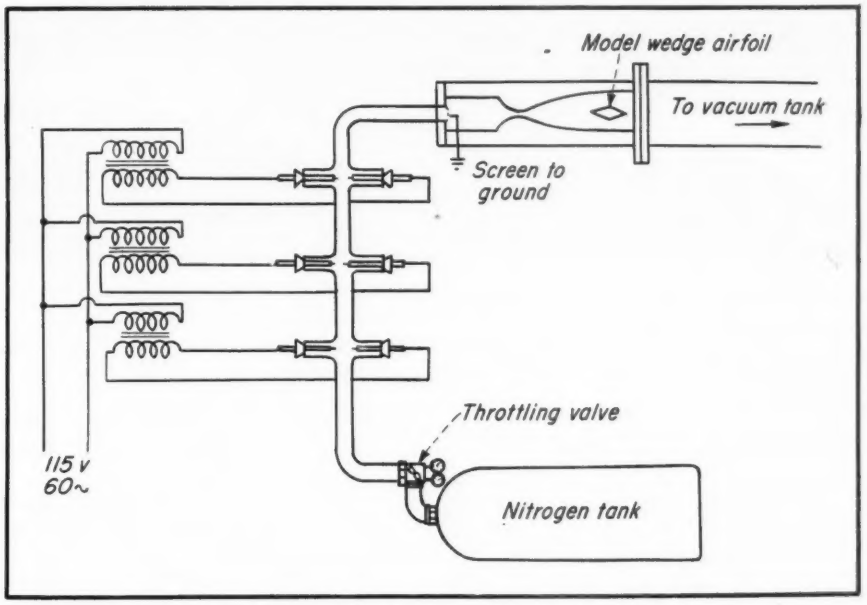


Fig. 2. Nitrogen afterglow research apparatus (Ref. 6).

Solving A Wind Tunnel Problem

In the study of superaerodynamics, low density flow visualization, NACA uses nitrogen afterglow.

By Robert McLarren

Future aerial warfare will require missiles flying at extremely high speed and altitude. For purposes of research these two areas often are separated into hypersonics (very high Mach numbers) and superaerodynamics (very low densities).

In the wind tunnel, however, both of these studies are characterized by very low pressures and it is becoming increasingly difficult to assess properly the contribution of each of these fields to an observed phenomenon. Only solution to this problem is continued research in the separate fields, with particular emphasis on the science of rarified gas flows.

▶**Flow Data**—The science of superaerodynamics treats of fluid flows of such low density that the mean free path of the molecules becomes of importance.[1] This is defined as the distance a particle or molecule of a fluid must travel before it collides with another. As an index to the variation of this distance with density (altitude), its value at sea level is 0.0000003 ft., whereas at about 75 mi. high its value is about 1.0 ft.

However, these absolute values are of little practical importance and a more vital factor is the ratio of the mean free path l, to some characteristic dimension of an object (such as a missile) immersed in the fluid. For example, the fact that the mean free path at 75 mi. is 1.0 ft. would be of little consequence to a missile 1000 ft. long, but would be of great importance in the behavior of a missile only 1.0 ft. long.

For research purposes, thickness, δ, of the boundary layer on the object, is taken as the characteristic dimension, and the ratio l/δ is the controlling parameter in the determination of the relative importance of mean free path on the performance of a missile.

▶**Regions Defined**—When this ratio is quite small (0.01 or less), the air may be considered a continuum and conventional compressible-flow equations used.

As this ratio increases, however, chances of the molecules colliding with each other become about equal to the probability of their colliding with the wall or surface of the missile. Therefore, the fluid will no longer "stick" to the wall but, instead, will slip over the surface with a definite velocity. Region in which the ratio l/δ is less than 1.0, then, is termed the "slip flow" region.

At values of the parameter greater than 10 (that is, mean free path is 10 times that of the boundary layer), the chances of the molecules colliding with each other become slim and the gas may be considered a stream of free molecules colliding with the wall. This region is termed "free molecule flow."

Thus, just as the velocity spectrum is divided into subsonic, transonic and supersonic regimes, so, too, is the density spectrum divided into aerodynamics, slip-flow superaerodynamics and free-molecule-flow superaerodynamics.

Each of these regions is a special field of study, with aerodynamics already well understood, free-molecule-flow superaerodynamics of only academic interest and slip-flow superaerodynamics a field of important current interest.

As in all research, the first stage of the investigation of this new field of superaerodynamics was theoretical study which was begun by Maxwell in 1879 and continued more recently by Zahm[2] (who gave this new science its name) and Tsien[3, 4] (who developed it into a

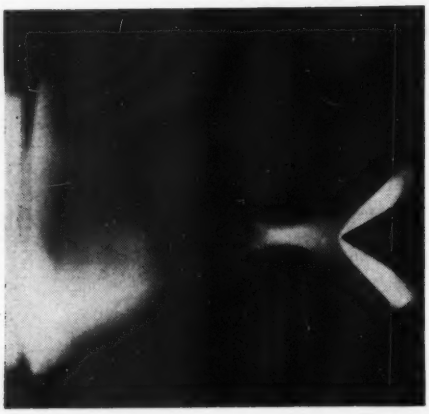


Fig. 3. Afterglow pattern over 50-deg. wedge in stream from conical nozzle. Stagnation pressure is 140 microns Hg, Mach 2.

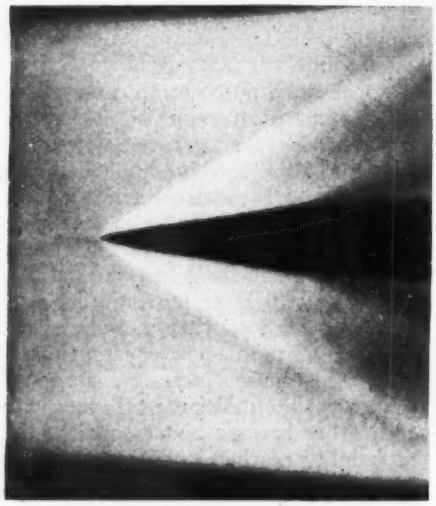


Fig. 4. Afterglow over 15-deg. wedge. Stagnation pressure 60mm. Hg, Mach 2.6.

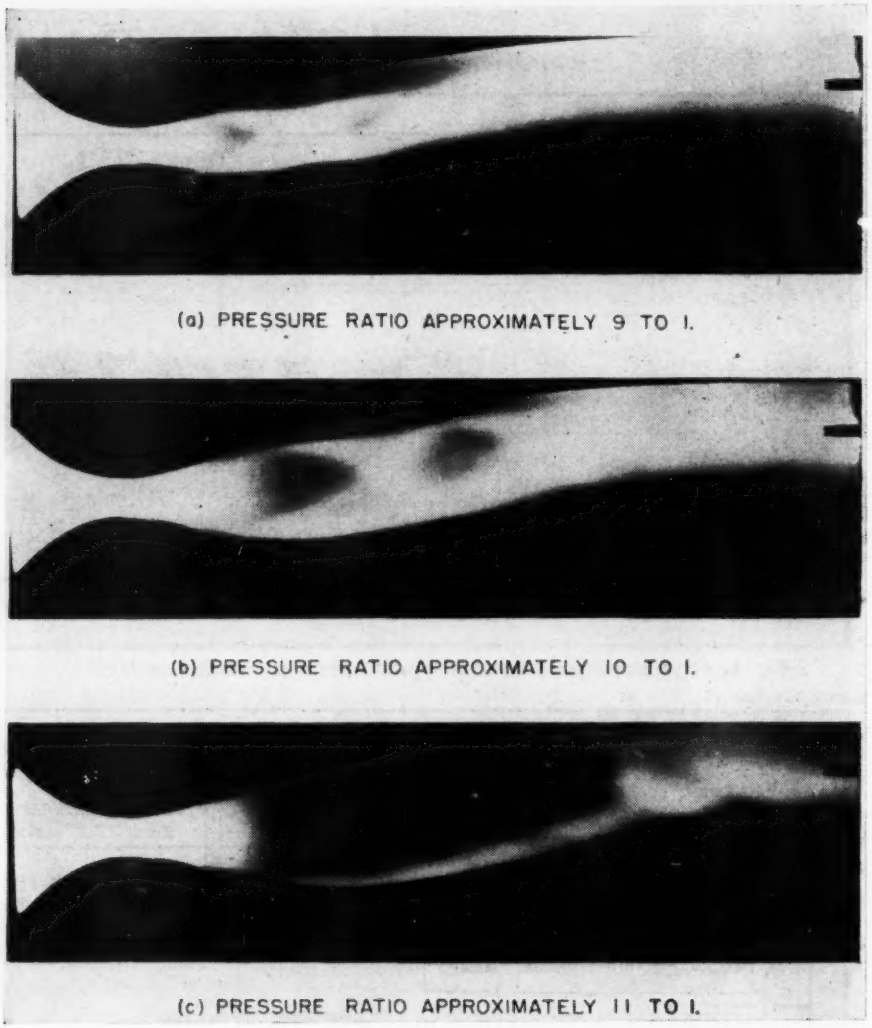


Fig. 5. Photographs of stream of glowing nitrogen with a stagnation pressure of approximately 20mm. Hg. (The nozzle does not fill for these pressure ratios.)

separate body of scientific knowledge).

The second stage, experimental study, has been delayed until very recently by mechanical difficulties in the testing techniques of airflow at low pressures.

▶ **Flow Visualization**—The conventional schlieren method of flow visualization utilizes the refraction of light by density changes in the fluid to produce a qualitative indication of the flow field. It has proved an invaluable laboratory tool for the study of transonic and supersonic flows.

As the Mach number of such studies has increased and the density of the flows decreased, however, the sensitivity of the light refraction has decreased to a point within the range of optical imperfections in the schlieren windows and mirrors, thereby rendering useless any further changes in test conditions.

Prof. Joseph Kaplan, of the University of California, suggested about two years ago that the ability of certain gases to absorb or radiate energy might be used to enable the stream to provide its own light for flow visualization.

Examples of the first (absorption) type of gas are oxygen, which has a strong absorption band at a wavelength of 1470 Å (Angström units) and ozone and mercury vapor, both which have strong absorption at 2537 Å.

Under a contract with the Office of Naval Research, scientists at the University of California examined these three gases and determined that flow visualization is possible for a limited range of low pressures.[5]

Both the mercury vapor and ozone were abandoned for the purpose, because of the low vapor pressure and heavy molecule of the former, explosive instability of the latter.

Preliminary tests with oxygen show it to have promising absorption characteristics. A hot cathode discharge tube with a xenon atmosphere was used for the generation of 1470 Å light. The cathode is fed from a 220v. 60-cycle supply and is started by an r-f field at the capillary of the tube.

▶ **Oxygen Absorption Setup**—Fig. 1 illustrates the arrangement of the apparatus. The capillary section is viewed from the end through a fluorite window. Oxygen pressure could be varied within a chamber around the window. A second window, coated with fluorescent material, was excited by radiation passing through the fluorite window.

As oxygen pressure was varied, change in fluorescent intensity was measured by a photomultiplier tube.

This absorption apparatus is used as a light source across a wind tunnel test section, and a suitable fluorite optical system provides parallel light. Light traversing the test section is absorbed by an amount depending on the density of the fluid. Changes in fluorescent intensity are then detected by a fluorescent screen or photographic film.

▶ **Nitrogen Afterglow**—A much simpler method, now undergoing investigation at NACA makes use of radiation or "afterglow," a characteristic of the luminescence that persists in certain gases for an appreciable length of time after the source of excitation has been removed.[6] Length of afterglow in such gases as oxygen, argon, helium and mercury vapor is measured in times ranging from miscroseconds to minutes, but afterglow of nitrogen persists for times ranging from minutes to hours.

Afterglow of nitrogen (often termed

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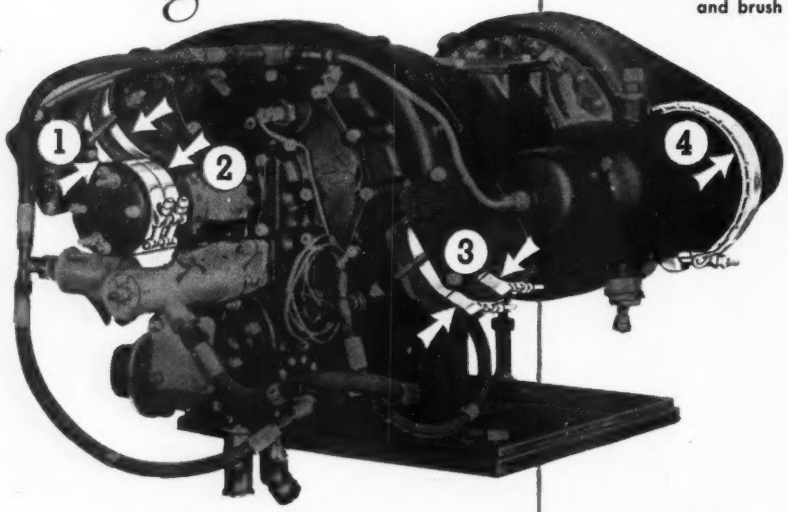

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Lewis-Rayleigh afterglow, after its principal workers) increases with a sudden increase in density of the glowing gas. For pressures of the order of 0.1 mm. of mercury, the intensity increases as the cube of the density, although under other conditions this increase followed a lower power of the density.

This variation in afterglow intensity with fluid density comprises a useful method for the visual observation of low-density streams in a wind tunnel.

► **Afterglow Apparatus**—Simplicity of the afterglow method lies in the means used to excite the gas.

Fig. 2 illustrates the method used at the NACA Langley Aeronautical Laboratory. The electric discharge tubes are 1 in. inside diameter, 18 in. long, and contain ¼-in. diameter aluminum rod electrodes with 0.04 in. tungsten wires inserted through and projecting about ¼ in. into the stream.

The arcs are powered by 115v., 60-cycle supply, stepped up through transformers. First pair of transformers are rated at 3000v. on the secondary and 300v.-amp. output. The other two arcs are supplied with transformers rated at 7000v. on the secondary and about 3000v.-amp. output.

Nitrogen is supplied from a pressure tank, through a throttling valve and into the arc manifold, where it is excited. The glowing gas then passes through the test section of the tunnel, then into a large vacuum tank. An electrically grounded, fine-mesh, stainless-steel screen is placed across the entrance to the tunnel to eliminate corona effects in the flow.

► **Afterglow vs. Schlieren**—To provide direct comparison between the new afterglow and conventional schlieren methods, range of densities tested were those at which it was known that schlieren methods were of limited value yet high enough for comparative purposes.

Study of a representative schlieren photograph showed that a normal shock would be barely visible at Mach 2.6 and a stream density of 8.5×10^{-6} slugs per cu. ft.

The afterglow test at a static pressure of 3.0 mm. produced a stream density of 20×10^{-6} at Mach 2.6, so that the afterglow pictures were slightly above the minimum schlieren accuracy.

Results of the tests, as indicated by Figs. 3, 4 and 5 show that afterglow patterns generally resemble schlieren photographs but are more effective at the lower densities.

But a number of problems remain to be solved. Impurities in the nitrogen affect the intensity and quality of the afterglow, particularly the presence of hydrogen and water vapor.

A marked decrease in brightness of the afterglow is observable in the wake

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of the models. This is believed to be caused by a degradation of excitation in regions of turbulent flow.

A promising factor in the new afterglow method, however, is the fact that since nitrogen (used in these tests) is the principal constituent of air and has essentially the same thermodynamic characteristics, there is every reason to believe that air may be used as the fluid in afterglow tests. Some tests of dry air proved its ability to exhibit afterglow sufficiently bright to be photographed.

Although such problems as ionization and dissociation in the stream remain to be more carefully analyzed, these preliminary tests indicate promise that wind tunnel usefulness can be extended to studies of superaerodynamics and that the afterglow method is a practical means for preliminary examination of new wing or missile forms at stimulated high speed and altitude.

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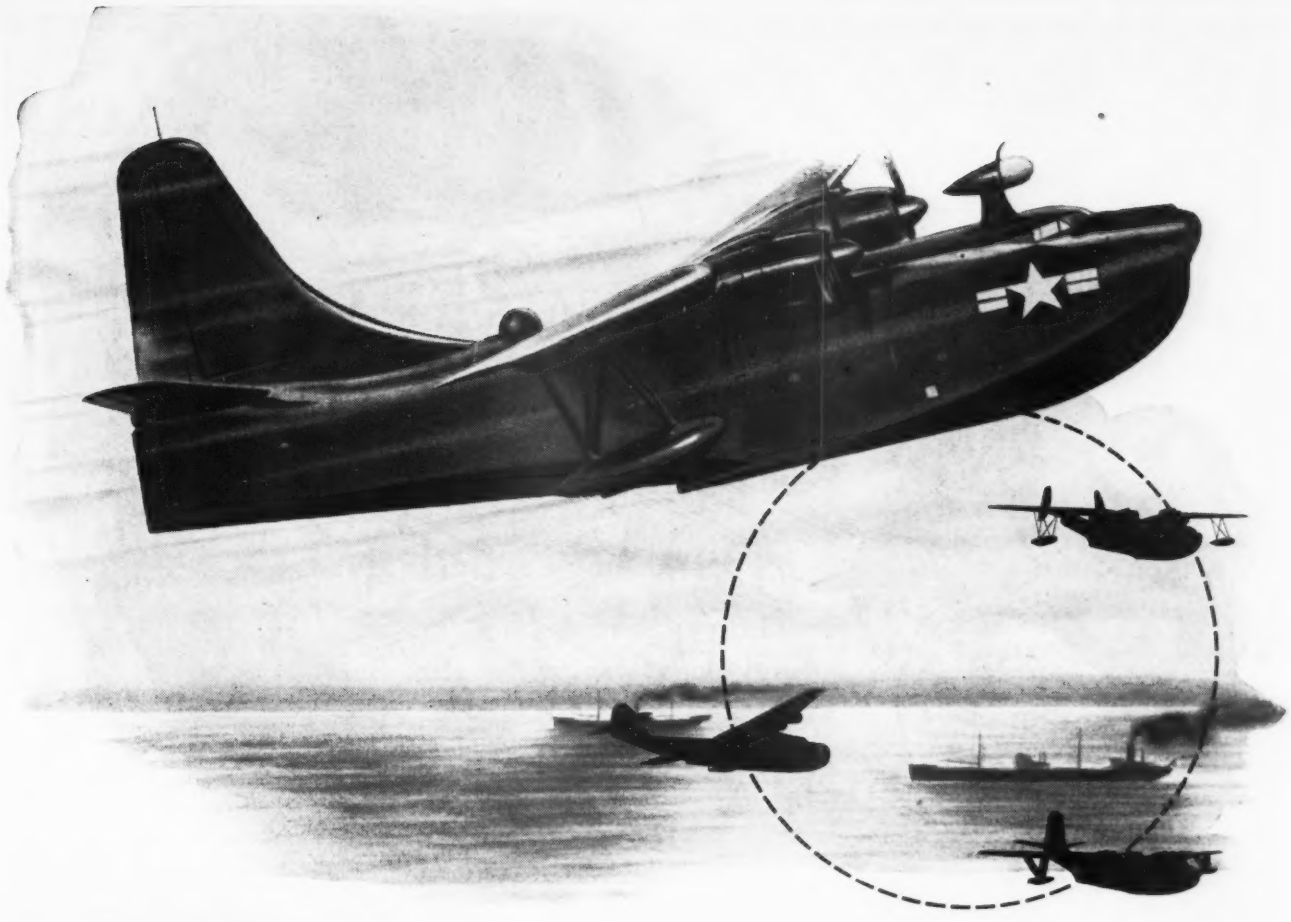

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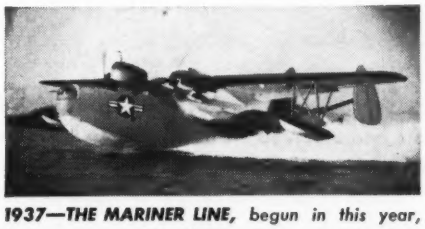

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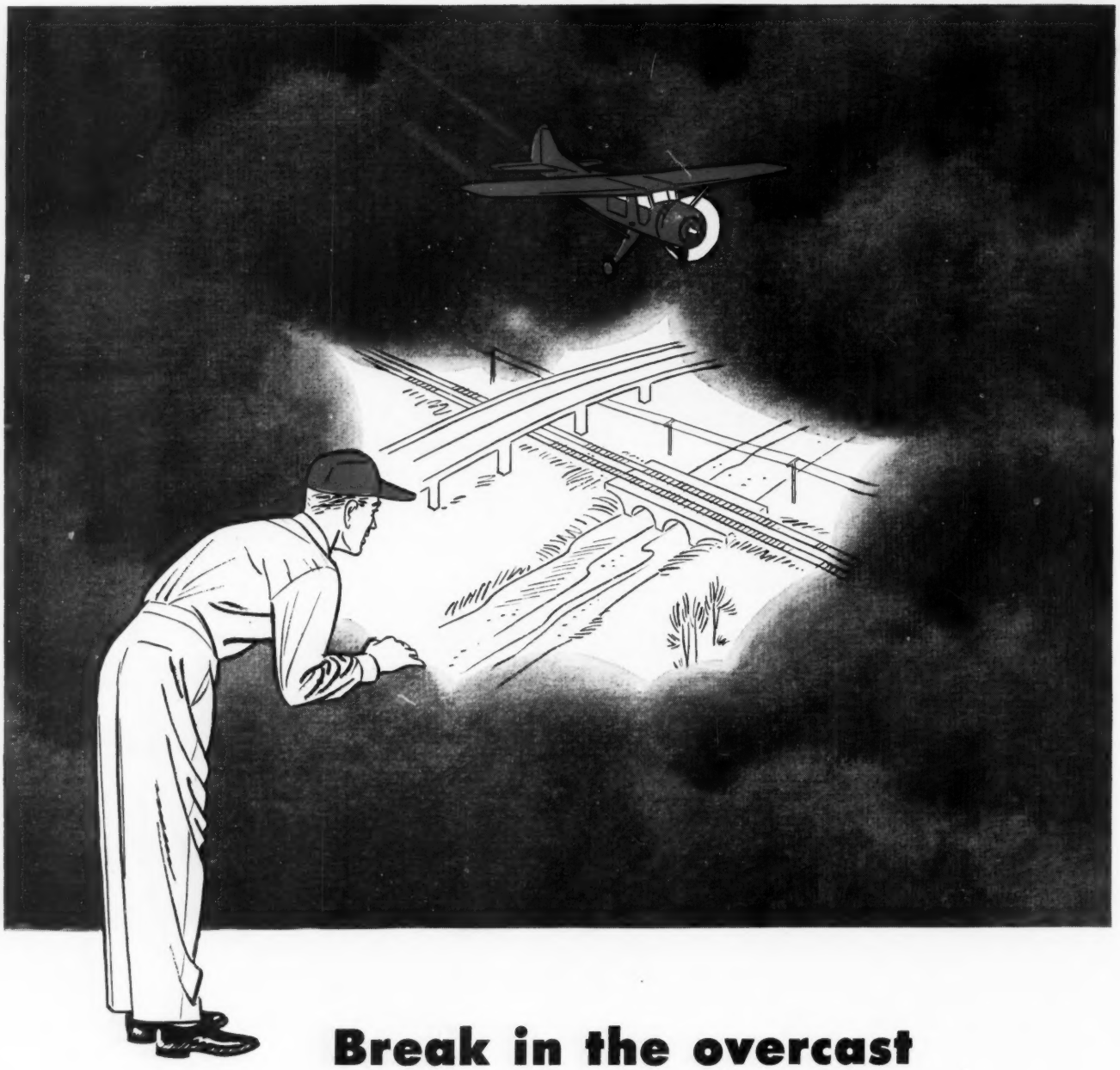

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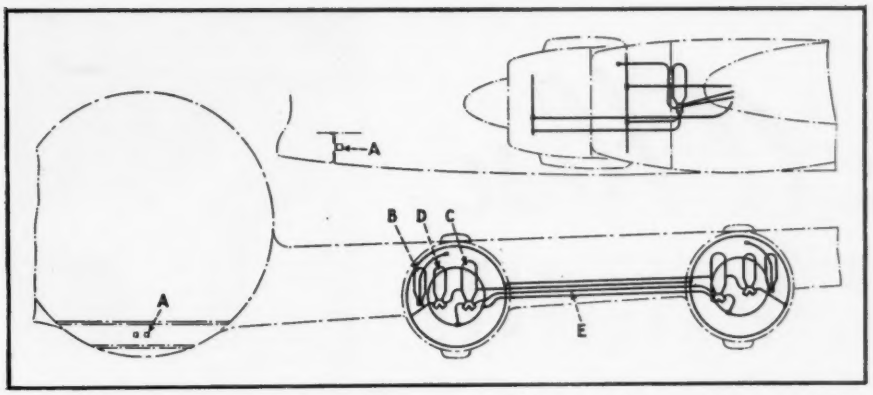


Schematic layout of Graviner two shot extinguisher system with automatic crash protection: (A) Crash-operated switches mounted forward in belly; (B) 6-lb.-charge extinguisher feeding carburetor intake; (C) 12-lb. charge feeding front spray ring; (D) 6-lb. charge for rear spray ring; and (E) cross-over piping on secondary heads.

How to Cut Crash-Fire Dangers

Many fatal blazes can be avoided by use of inertia switch that operates regular extinguishing equipment.

By Neill G. Bennett

Fire is the greatest hazard left in flying. Aviation's greatest killer, it is accountable for up to 70 percent of all fatalities in airplane crashes. It is a hazard by no means limited to any single type of operation but one which faces all who fly, the air traveler in the big transport and the air crewman in the military plane alike.

Fire aloft is a fearsome thing, but fire in a crash is even a greater and more prevalent threat to life. We have come a long way in our efforts to prevent fires in flight. We know how to detect them early, and are making rapid progress in learning how to extinguish them effectively.

▶ **Crash Fires**—While there is still room for improvement in this field, just a brief study of the records will show that even more room for progress and even greater safety gains can come from efforts directed toward preventing fire in a crash, or extinguishing it in the incipient stage.

Efforts at crash-fire suppression were begun in Great Britain during the war. The Air Registration Board has recognized the importance of crash-fire suppression and has made such provisions mandatory. We associated with the problem in Britain believe we have evolved an effective means of lowering the likelihood of fire in crashes.

Modern aircraft are unquestionably safe vehicles. But they are not by any means as safe in a crash as we might make them. The designers may reply that they design their planes to fly, not to crash. But aircraft do crash and all too often the crash is the prelude to a fire which turns the ship into a pyre.

▶ **Crashes Survivable**—There are few statistics available as to the cause of death in accidents, for the evidence often is destroyed in the flames. We do know, however, that up to 70 percent of all crashes are fundamentally survivable. An extensive study of crash survival problems conducted by the Air Ministry Accidents Investigation Branch during the war showed conclusively that chances of crash survival could be increased considerably if the seemingly inevitable crash fire could be prevented or delayed.

This conclusion was not reached empirically but was based upon study of several thousands of crashes during the war years and extremely thorough investigation of many hundreds of crash fires. Part of the study covered every RAF crash in Britain during the later war years and for part of the time included USAAF crashes as well.

While, these were mostly military aircraft—some of which were damaged in combat—the lessons learned have a direct application to current commercial operations as well as current military flying.

▶ **Fire Greatest Risk**—The amount of wartime flying and the inherent hazards of operational flights gave an opportunity for the study of an unfortunately large number of crashes. It is particularly noteworthy that while the Accidents Investigation Branch considered all phases of the crash survival problem it soon became apparent that emphasis on crash fires was imperative. Fire was found to be the greatest killer. And so long as aircraft tanks are filled with highly inflammable fluid in close proximity to hot engines, fire is likely to remain the hardest of risks to eliminate.

The position is not hopeless, however, for not all airplanes turned themselves into bonfires on mishap. Experience showed that where no fire followed the crash, a high rate of survival might be expected. This experience reasonably can be expected to be true in peacetime operation.

▶ **Crash-Cause Allocation**—Well over 50 percent of all crashes are associated with takeoff, landing or forced landing when the aircraft is moving at relatively low speed. There is evidence that the great majority of occupants can survive the impact. In some such cases those not pinned in the wreckage or incapacitated by injury do escape. Prevention of fire in the wreckage would undoubtedly save the lives of the rest.

Second most frequent type of accident is that caused by flying into the ground when descending or flying into rising terrain at cruising speed. Here again evidence shows that at least a large proportion of the occupants can survive the impact. Actually, not more than 10 percent of all crashes occur with catastrophic impact such as is the case when a vertical mountain is struck or the aircraft dives into the ground after structural failure or collision.

Miscellaneous crashes not readily included in these groupings account for another 10 percent, and a very small proportion of crashes are ditchings.

▶ **Airborne Equipment Stressed**—In the supression of crash fires, we cannot depend upon ground equipment. Too few airports are adequately equipped, and in many cases the crash occurs outside the airfield boundaries.

Even if the crash occurs on a well-equipped field, the delay in manning

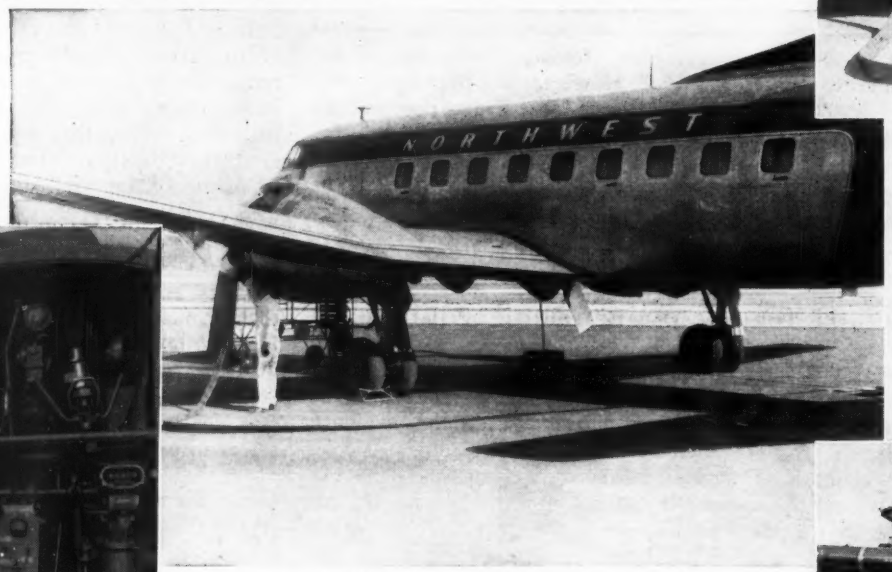
Expert Opinion

Former Royal Air Force Wing Commander Neill G. Bennett has been called one of the world's outstanding authorities on aircraft fires. During the war he was in the accidents investigating branch of the Air Ministry—for 18 months studying structural accidents, then heading the powerplant section, finally investigating flight fires.

He is now chief engineer of the aircraft division of Graviner Manufacturing Co., the principal British producer of airborne fire protection equipment. He recently completed an extended tour of the U. S. under sponsorship of Simmonds Aerocessories, Inc., studying fire-fighting methods in this country. Because of this well-rounded background AVIATION WEEK asked Commander Bennett to write the accompanying article.

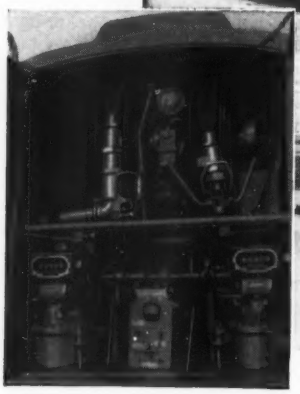
Wayne Collaps-A-Hose®

SYSTEM SPEEDS UP FUELING FOR NORTHWEST AIRLINES



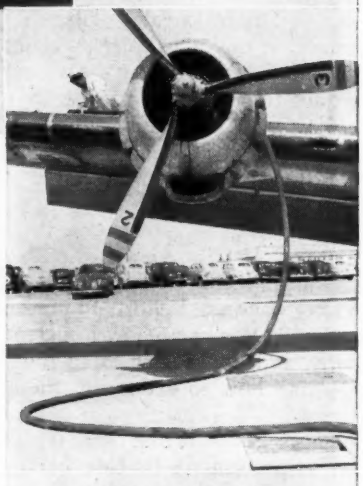
NORTHWEST USES UNDER-WING FUELING

Time studies show total fueling time is reduced. Collaps-A-Hose increases safety and convenience.



Typical Truck Installation

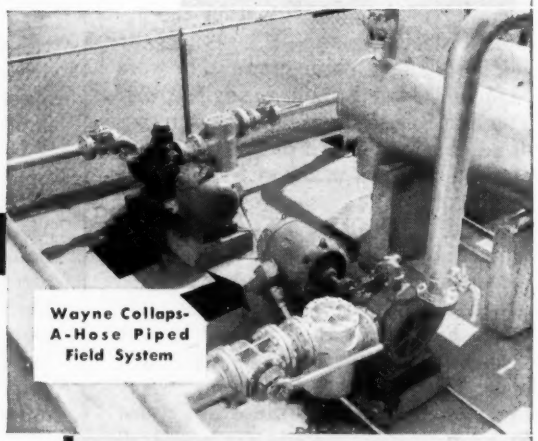
A recent photograph of fueling operation at Rochester Airport, Rochester, Minnesota, one of several Northwest airports where Wayne Collaps-A-Hose System is in use.



SAFE FOR OVER-WING FUELING, TOO

NORTHWEST PLEASED WITH WAYNE COLLAPS-A-HOSE SYSTEM

MILTON W. RUDELL, Engineer in charge of Plant and Equipment, says, "Northwest Airlines has found that the Wayne Collaps-A-Hose Fueling Systems offer several distinct advantages in providing a convenient and controllable 200 GPM delivery rate at low pumping pressures. The collapsed, light-weight, flexible hose has proven to be extremely desirable for underwing fueling in making a fast and easy connection to the aircraft at arm's length above the head. The nozzle control switch has considerably speeded up and simplified the fueling operation; and for Boeing 377 underwing fueling, this milliampere circuit provides a simple and safe means of connecting pump control to the aircraft tank fuel-level safety shut-off. The small, narrow reel, made possible by Wayne's collapsible hose, is a space saver in the pit installations which Northwest Airlines has in use." You will find this equipment useful in meeting your problems, too. Get the whole story now.



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Installed by Standard of California at San Francisco Airport

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the apparatus and reaching the plane may well prove fatal, for fire spreads with explosive rapidity when high octane gasoline is the fuel.

Valuable as ground equipment may be, we must look to airborne equipment if we are to get the maximum possible crash fire protection.

It is possible to get effective crash fire suppression without serious weight penalties by using the engine fire extinguishing equipment and supplementing it with devices to operate it automatically in a crash.

► **Source Factors**—Possible sources of ignition in crash fires are: Exhaust flames from engines, hot metal such as exhaust piping, possible high temperatures or sparks caused by the continued rotation of damaged parts, sparking or burning from short circuits or grounds or from the continued functioning of unflameproofed electrical apparatus, and from sparks caused by ground friction

Continued rotation of damaged parts, previously not a worry as a result of propeller stoppage when striking the ground, might become a serious problem with free running turbines.

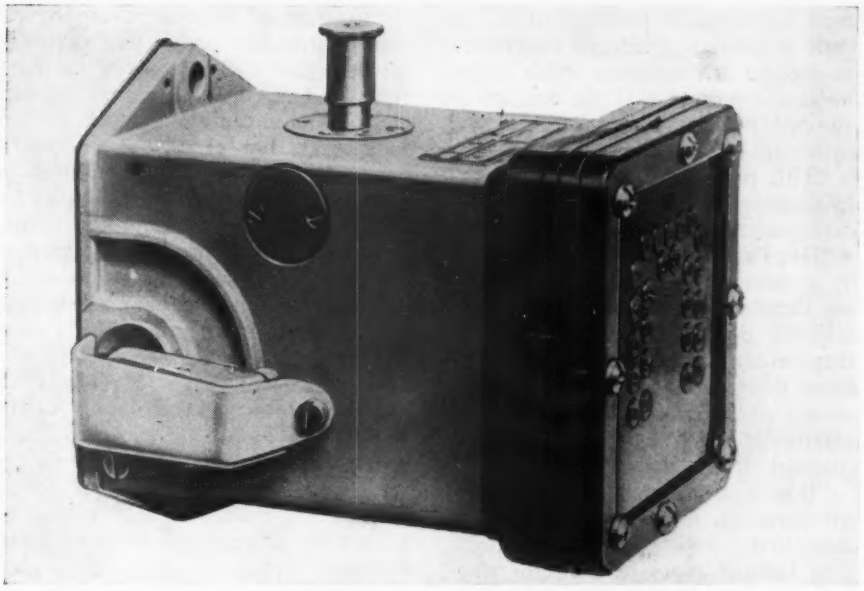
Nearly all danger of occupants being burned in a crash comes from the fuel. There is usually so much of it that it spreads rapidly through the wreckage. And it burns so fiercely that when subjected to a fuel fire for more than a few seconds, a person cannot survive.

Much can be done to minimize the chance of rupture of the fuel and oil tanks. Danger from lubricating and hydraulic oil, etc., does not come primarily from its own contribution to the ferocity or extent of the fire. The oil may start a comparatively small fire in a crashed powerplant, which although not in itself serious, will almost certainly ignite any fuel flowing from severed lines and strained tanks.

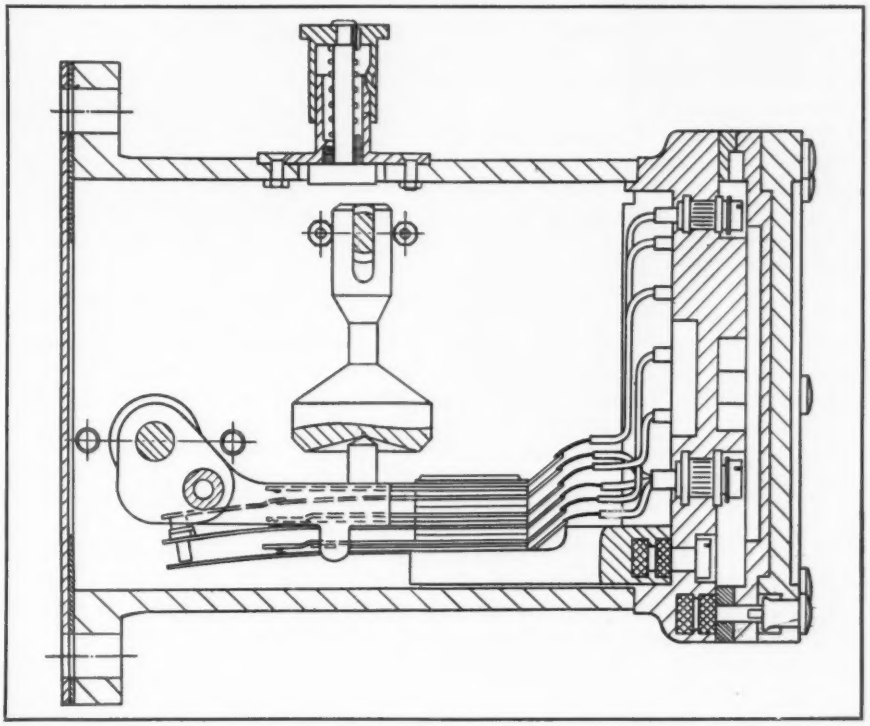
► **Equipment Limitations**—Before considering what crash equipment can do, it is as well to examine briefly what it cannot do, at least for the present. It cannot guarantee prevention of fuel tank rupture; it cannot relocate tanks away from engine exhausts; it probably cannot shut down an engine with sufficient rapidity to prevent ignition of petrol poured or thrown over the exhausts in the early stages of a crash; it cannot put out a blazing plane or even a single blazing tank.

It must be clearly realized that crash fire precaution equipment functions as a preventive. It can do much to prevent a fire from ever starting in a minor crash, and even in a crash of considerable severity, but its effectiveness, especially in the latter case, will depend on the location and protection of the fuel tanks.

If the fuel is poured from a strained integral tank just behind an engine exhaust before most of the aircraft has even hit the ground, not a crash switch, but a miracle, is required to stop a conflagration.



Graviner inertia type crash switch for fire extinguishing equipment. Device operates at predetermined value of G deceleration. Test knob is at top, reset lever at side.



Sectional view of switch. Inertia element comprises pendulum suspended universally and spring-loaded lever arm on cross-shaft which carries cam. Peg on arm engages pendulum undersurface. When required G value is applied, pendulum overrides peg, lever arm shaft and cam rotate through 90 deg., and leaf contacts are operated.

► **Crash System Function**—Thus it appears that the task of the crash system is readily discernable. It can do much to prevent ignition by four of the sources mentioned and the other, sparks from ground friction, is unlikely to be a serious danger with reasonable tank installation design.

The following paragraphs, taken from the Air Registration Board's paper No. 78, dated July 8, 1948, outline what can be done in each of the instances.

• **"Exhaust Flames.** It has not been considered necessary to make the crash switch shut down conventional piston engines because, before there is sufficient damage to powerplant or tanks to permit a fire, the engine has been stopped by the propeller in the ground.

"In any installation in which this may not occur (for example, piston engines with shaft drives, free turbines, or

even conventional powerplants on aircraft incorporating integral tanks liable to rupture in conditions which do not necessarily ensure that the engines are stopped in the ground immediately), switch should shut down the engine.

"This probably can be effected best by shutting off the fuel and by injecting extinguishant into the engine intake.

• **"Hot Parts.** These can be dealt with by a crash-actuated extinguisher spraying them with extinguishant. This fulfills the dual function of blanketing them with extinguishant to put out any flame that might start before they are cooled, and attempting to obtain a temperature at which they will not promote combustion.

"It is most important that extinguishant should be actually injected into enclosed hot spaces such as exhaust ducts, long exhaust pipes or collector rings, turbine compartments and tailpipe ducts, and combination heater chambers.

• **"Continuing Rotation after Crash.** It is hoped that the main blanket of extinguishant over the engine will maintain a dead atmosphere until rotation ceases and the likelihood of ignition is removed.

• **"Ignition from Electrical System.** The ideal from the antifire point of view would be to cut off all sources of electricity, but owing to the need for some services to operate after the crash, this is not feasible.

"The best which can be done is for the crash switches to isolate the batteries from the main aircraft system, and either to run the emergency lighting, fire extinguisher circuits, etc., from separate low voltage, low capacity batteries, or from the battery side of the isolating switch.

"In the latter case the fire risk can be reduced by the use of low value fuses (2.5 amp.) in the emergency lighting circuits, by the isolation of the fire extinguishing-circuits through a time delay switch and the avoidance of sparking from the cables used on these circuits (as, by using insulated ducts or metal braided cable.)

"In the past, the batteries have been accepted as the only source of electrical power to persist after a crash, since the generators mounted on propeller-driving piston engines have stopped with the engine in a crash.

"However, in the case of free turbines which might run on for some time, it will be necessary to de-energize the generator fields, or if it will appreciably assist the stopping of the turbine, to short circuit the generator close to its terminals.

"The crash switch system can do less in regard to the protection of inflammable matter than for the sources of ignition, but even in this field it has several valuable functions.

"Isolation of the electric supply will stop electric fuel pumps and drop out solenoid fuel cocks supplying combustion heaters, etc. Operation of the crash switches can also be used to shut fuel cocks, but except where this is necessary, to stop an engine, it is of doubtful value to shut tank cocks for if the damage is sufficient to rupture the fuel system it may well be such as to cause a fuel loss anyway, in which case it is safer not to have a live cock circuit which may also have been damaged."

It is possible to get effective crash fire suppression without serious weight penalties or inordinate expense. Graviner, in its system, makes dual use of the engine fire extinguishing equipment by actuating it automatically in case of a crash through suitable crash switches.

► **Switch Types**—Crash switches used are of two types: an inertia switch so installed as to function when subjected to a predetermined value of G deceleration; and a skin deflection switch, operating when deflection greater than that which can occur in flight is encountered at the point of installation, usually some lower structural member. These switches, of course, are so designed as to preclude inadvertent operation.

Particular care has been taken in the design of the extinguishing equipment to assure that one-shot is sufficient to put out any blaze that is extinguishable. Zone 1 as well as zone 2 is protected and, in addition, methyl bromide is sprayed into the induction system to assure engine shutdown. (It has been found that no damage to the engine results even from repeated applications).

► **Operation Details**—The extinguisher is electrically operated. The fluid, methyl bromide, is contained in a copper cylinder pressure-tested to 350 psi. Head of the cylinder is fitted with an annular diaphragm which is ruptured by detonation of an explosive charge fired by a fuse adequately protected against inadvertent operation.

Rupture of the diaphragm allows the liquid methyl bromide to pour through a ¾-in. orifice to the piping system. Open end discharge is very rapid, amounting to less than 1.8 sec.

Disposition of the bottles is arranged to minimize the likelihood of ruptured pipelines in a crash. Centrally located containers, with the necessary lengths of pipeline, do not afford this protection for engines and are often dislocated or even torn from their mountings in belly landings. Rupturing of the pipelines would make such a system ineffective under the very conditions when its functioning is most urgently required.

► **Areas Covered**—Methyl bromide bottles in the Graviner system generally are located directly behind the firewall of the engine they protect. They supply an amount of extinguishant proved adequate to all spaces forward of the firewall. Areas receiving special attention are: The exhaust system; those through which pipes or ducts carrying fuel, oil, hydraulic fluid, etc., pass; those into which such liquids or their vapors may enter; carburetor intake system; and areas into which fire may penetrate by reason of the low material-resistance.

On powerplants incorporating full feathering propellers, it has been found that the engine may be stopped more quickly if the agent is discharged into the induction system on the engine side of the throttle during feathering. This may be done by a separate extinguisher for the induction system. In flight fires it is important that the engine stop operating before the main extinguishing system is discharged. The special extinguisher is actuated simultaneously with the feathering button but only when an inter-connecting relay has been brought into the "ready" position by a flame detector signalling the presence of fire. Normal feathering and unfeathering is not affected.

Such installations have an added advantage in crashes in that the discharge of methyl bromide into the induction system increases the possibility of creating a column of inert, instead of explosive, gas within the hot exhaust system of an engine that may well be surrounded by leaking gasoline.

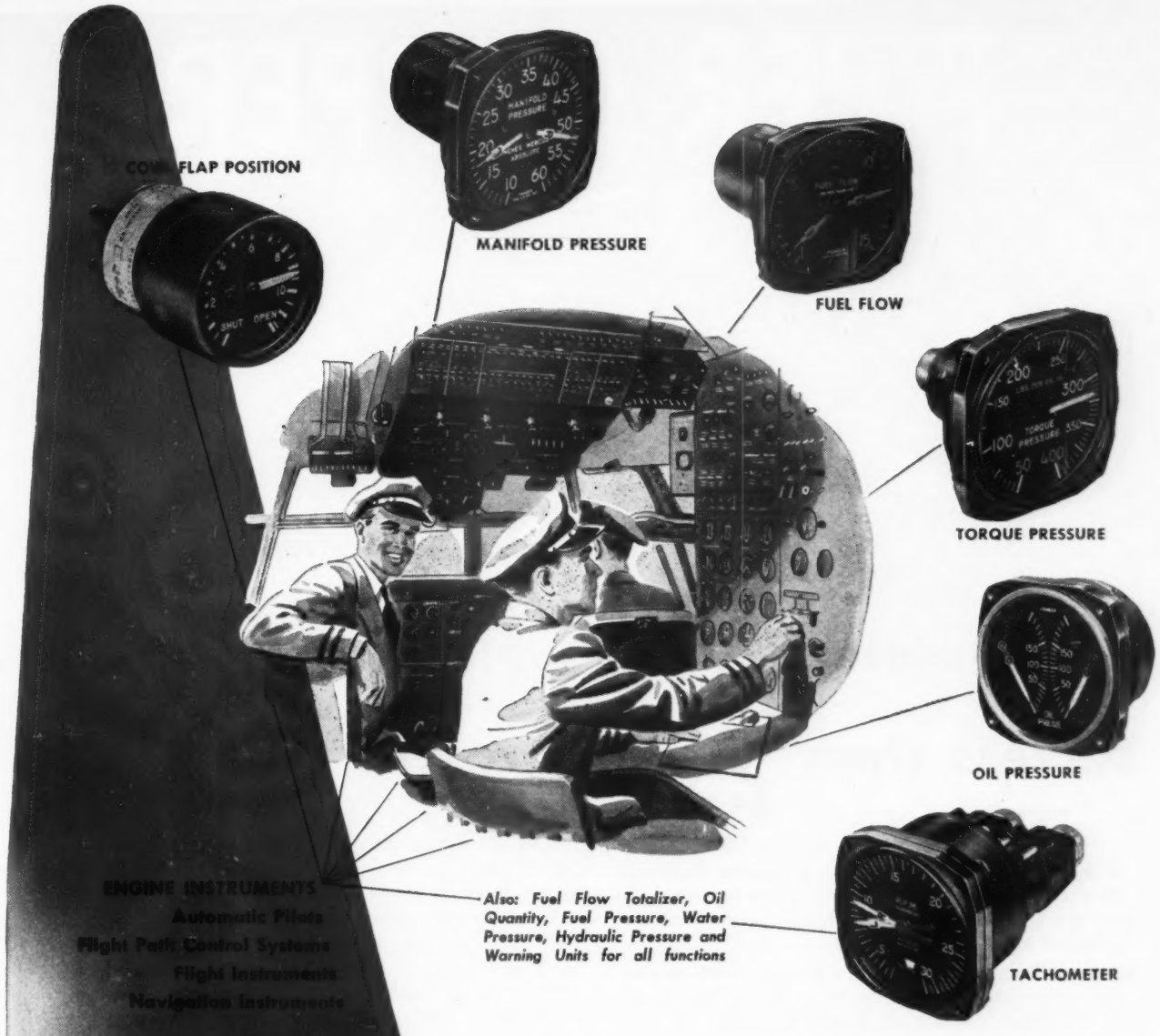
Crash survival is a many faceted problem. By discussing only the fire suppression phase, no intent to minimize the importance of the other factors is intended. But it would seem that unless aircraft are kept from turning into blazing torches in crash landings, it would avail little to enable the occupants to survive the impact only to succumb to fire. Especially since our experience has shown that many crash fires are preventable.

New Tool Steel

Bessemer "MX" free machining steel offered by Carnegie-Illinois Steel Corp., 434 Fifth Ave., Pittsburgh 30, Pa., is claimed to provide longer tool life and improved surface finish of parts.

Under development for over five years, MX is said to give 20 percent increase in machinability over standard Bessemer steel bar stock of comparable grade. Product was developed specifically to augment machining characteristics of Grade B-1113 steel in many applications where that grade formerly was recommended.

The new steel also has performed well in operations requiring forming and crimping of machined parts.



ONE Source, ONE High Quality, for Virtually Every Instrument in Your Flight Engineer's "Office"

The nerve center in the huge and complex aircraft of today is the Flight Engineer's instrument panel. To assure you the utmost in uniformity and accuracy in this vital spot, Eclipse-Pioneer provides precision remote indicating systems for practically every engine function required. Each instrument is an example of the skill and craftsmanship that have built Eclipse-Pioneer's reputation—one of the oldest and finest in the field. When you specify these all-important engine instruments for your planes, give yourself every advantage by selecting Eclipse-Pioneer—one source, one high quality for all.

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only $2995 (Standard Model) FAF Lock Haven, Penna.

At less than 2 place cost!

The flood of orders for the Piper Clipper is convincing proof of the overwhelming approval given this remarkable 4-place plane which sells for less than many 2-place ships, and for half the price of most 4-place planes.

Yes, veteran pilots, critical private owners and experienced operators have flown the sensational Clipper under all conditions. They've tried it fully-loaded from high-altitude airports and off hot, tropical runways; they've checked it on long cross-country trips.

"Performance better than advertised" is their usual comment.

For $2,995 you get a 115 Hp plane which will carry four people cross-country at less cost than by bus. You get a comfortably roomy craft which cruises at better than 110 mph and has plenty of "get-up and go". Stall and spin-resistant, the Clipper has the added flight characteristic of riding through rough air with the solid feeling of a much heavier airplane.

Flight-wise, price-wise, the Clipper sets new standards of performance and economy which add up to new practicability for the private owner and new profit possibilities for the operator.

Amaze yourself with a demonstration flight in the Clipper before you buy anything, new or used. See your nearest Piper dealer or write to Dept. AW-4, Piper Aircraft Corporation, Lock Haven, Penna. for illustrated brochure.

The Piper Line for '49 also includes these fine airplanes: PIPER-STINSON Flying Station Wagon. PIPER PA-14 Family Cruiser. PIPER PA-15 and PA-17 Vagabond. PIPER PA-11 Cub 90.

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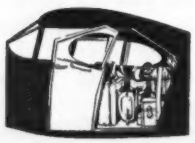
CARGO SPACE



Rear seat is quickly removable for freight. Large rear door makes loading easy. 36 cubic feet capacity.

PLENTY OF ROOM

There's plenty of room in the Clipper. Front seat is adjustable for added comfort.

115 HORSEPOWER

"Round-the-world" Lycoming with new Piper cross-over exhaust for extra take-off power, has starter, generator as standard.

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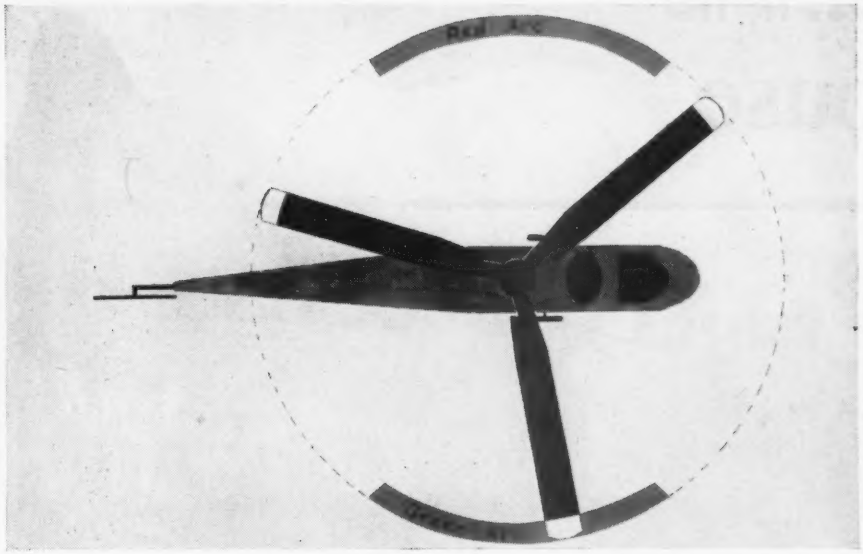
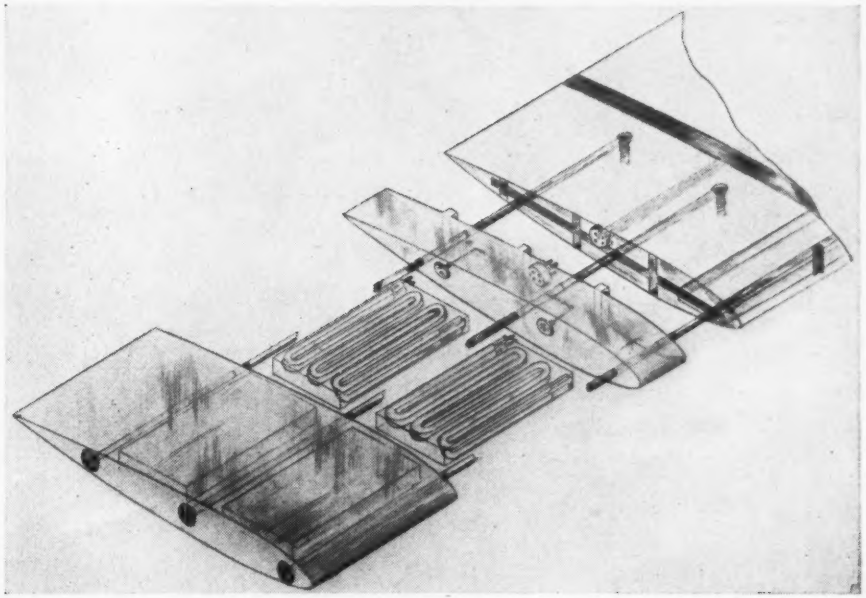




Glow Tubes for Copter Tip Lights

A novel navigation light installation for helicopters has been developed by Everett R. Stewart of Glendale, Calif., to provide greater utilization and safety for rotorcraft in night-flying operations.

This new system uses glow tubes instead of filament bulbs for longer life and provides the copter with identification bands of high-intensity red and green lights at the tips of the rotor blades for maximum visibility.

Neon gas (for red) and mercury vapor (for green) are sealed in glass tubing less than ¼ in. in diameter and bent double several times to give a grid pattern of large glow area—100 in. of tubing being housed in a space 4 in. square by ½ in. thick.

One red and one green light is cast into a transparent plastic cover. Outside surface of this housing is machined to the exact dimensions of the original 6 in. portion of the blade tip.

A slip ring attached to the rotor shaft affords electrical connection between the power source in the fuselage, rotating shaft and the tip lights. Another slip ring in the form of a commutator around the rotor shaft energizes the red and green units at the proper instant as the blades rotate.

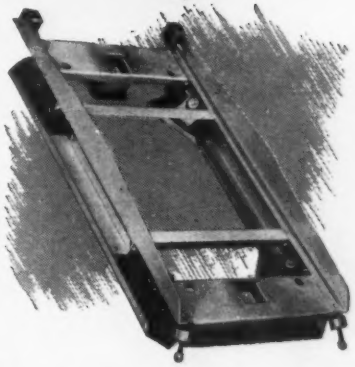
Red light in each tip is energized only while passing through the quarter circle arc on the left side of the fuselage; the green, when on the right side of the fuselage. At all other times the lights are out.

Since the colored arcs on either side of the helicopter reappear frequently, the lights appear to glow continuously.

The glow-tube makeup shows promise of withstanding great vibration and centrifugal force without damage.

The system is under scrutiny at the Navy Bureau of Areonautics' experimental station, Anacostia, Md.

the *new* LORD *Radiofocal*



gives greater protection from vibration and shock!

With a background of wide experience in the isolation of aircraft radio equipment, Lord has developed the Radiofocal, as a standard and complete mounting system.

1 Designed to meet specification JAN-C-172A.

2 Low natural frequencies under both vertical and horizontal excitation.

3 High attenuation throughout the range of aircraft disturbing frequencies.

4 Minimum sway space required.

5 Equally efficient when operating on an incline plane.

Additional information furnished upon request

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A Lift and a Light for Berlin

"Aircraft's greatest achievement." That statement has been applied many times to the Berlin Airlift. And rightly so. The Airlift has changed all military logistic concepts . . . lessons learned from the operation will affect the future of all aviation.

Among equipment selected for this vital task, the Westinghouse name appears with significant frequency . . . particularly in those applications where dependable performance counts most. Typical examples are shown on these pages. A new cargo hoist—more powerful and with many times the life of former units. Flashing beacon lights—that flash with a brilliance 9 times greater than the sun's. Transformers—that can take a direct stroke of lightning without failure.

These illustrate why, on the tough assignments—that call for unfailing performance—you'll find Westinghouse equipment being selected. And it is also why Westinghouse is your best source of supply for all your aircraft needs—from tiny aircraft lamps to powerful turbo-jet engines . . . from radio and radar to giant wind tunnels.

Check the complete line of Westinghouse Aircraft products. Call your local Westinghouse Office, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa. J-94797

Hoist speeds loading and unloading

Westinghouse engineering was put to test when asked to design a cargo hoist unit that would be dependable under all conditions . . . be completely explosion-proof. The answer is illustrated here. This unit can lift 4,300 lbs. of cargo at 24 feet per minute . . . weighs only ninety-two pounds. The assembly consists of a twenty-four volt motor, a triple planetary gear, a speed limiter and a magnetic brake. Because of its long life, no spare need be carried by the plane, saving weight.

Lights penetrate heaviest fog

A major problem of the Airlift has been its flight-grounding fog. To combat this condition, Westinghouse Flashing Beacon Lights are being installed at seven Airlift fields for identification purposes. These lights make visual landings possible under worst weather conditions. Flashing 40 times a minute, the light can penetrate the heaviest fog for a distance of at least 1,000 feet. However, the peak flash does not blind the pilot because its apparent duration is so short. On clear or hazy days, or clear to light foggy nights, the intensity can be reduced.

Sure transformer operation

The "CSP" (Completely-Self-Protecting) transformer—long accepted as the best transformer under all conditions—protects itself against lightning, short circuits and overloads. At the Airlift, 414 "CSP" transformers are being used for approach and other airfield lighting.

Westinghouse

LEADER IN AVIATION EQUIPMENT

The Birdmen's Perch

By *Major Al Williams*, ALIAS, "TATTERED WING TIPS,"
Manager—Gulf Aviation Department, Gulf Bldg., Pittsburgh 30, Pa.

They're still scrapping about those two de luxe private planes.

Champions of the two similar-but-different 4-place, $10,000 class planes got to snarling at each other about take-off run, landing characteristics, climbing speed, etc. So they set up a contest at Albuquerque (altitude: 5365′) to prove which was the better plane.

One plane took off (no load but pilot and full tanks) in 330′ . . . landed in 348′ over a 7′ obstacle. The other got off in 395′ . . . got back in 402′ over the obstacle. The latter plane had about 3 miles more wind, according to the tower.

But all over the country, every owner or pilot of these two types of planes is screeching why the test was (or wasn't) a fair one. And offering to prove it!

Of course, arguments like this one are one of the most delightful parts of this flying business.

But even more delightful is comparing *either* of these airplanes to planes in the same class 10 or 15 years ago!

Yessir, this is a swift business!

REPORT CARD

Been getting more reports from operators and owners around the country on Gulfpride Aviation Oil—Series D.

They tell us that this great new oil for horizontally opposed engines has helped them boost overhaul periods to over 1000 hours!

They say the detergent qualities of Gulfpride Aviation Oil—Series D—practically eliminate stuck rings and valves.

They've found that the dispersent characteristics let them use Series D in clean or dirty engines . . . that foreign matter in the engine stays in suspension in the oil until it is drained off at changes.

And sure enough . . . just like we've

said for years . . . they've discovered that Gulf's exclusive Alchlor Process gets more of the non-lubricants, more of the impurities out of Gulfpride Aviation—Series D—giving them more honest lubrication per quart of oil!

It's the world's finest oil for horizontally opposed engines.

Better use it.

LITTLE KNOWN FACTS DEPT.

Lt. Comdr. Sheldon Kinney, Naval Base, South Carolina: *Thank you for your Fact. Now if you'll send proof, we can use it.*

J. R. Crandall, Springport, Indiana: *Ditto above.*

Roy E. Kelly, Chief Technician, Treasury Law Enforcement Agencies, Bethesda, Md.: Thank you for an interesting Little Known Fact. Thanks for the proof, too. Your Commission as Perch Pilot (bottom rung) is on the way for:

"In 45 hours 15 minutes flight time, a Coast Guard piloted L5 recently smoked out 142 moonshine stills in a single state, involving $60,000 in tax frauds, plus much more in fines and penalties!"

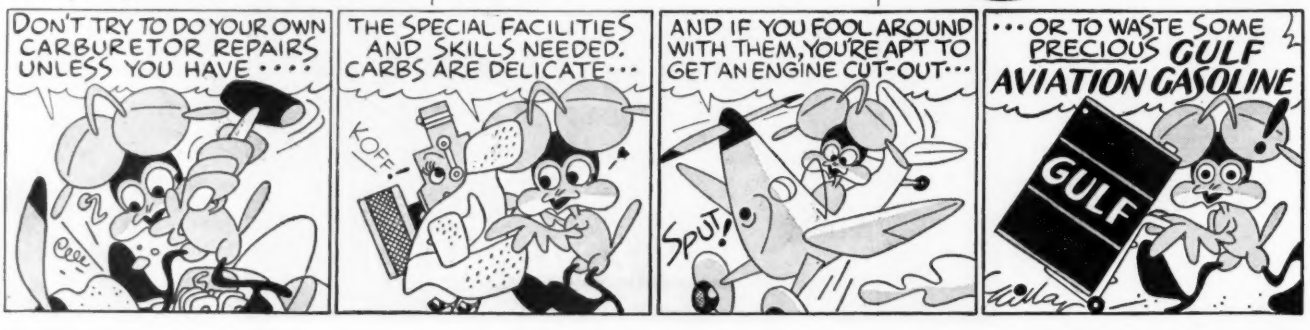
That's all there is to it, gents. One Little Known Fact plus one proof of same equals one Commission as Perch Pilot (br). Five of 'em get you promoted to Senior Perch Pilot.

And 20 of 'em (gasp) make you a Command Pilot!

The address is up on top there.

Gulf Oil Corporation and Gulf Refining Company . . . makers of

GULF **GULF AVIATION PRODUCTS**


DON'T TRY TO DO YOUR OWN CARBURETOR REPAIRS UNLESS YOU HAVE . . . .
THE SPECIAL FACILITIES AND SKILLS NEEDED. CARBS ARE DELICATE . . .
KOFF!
AND IF YOU FOOL AROUND WITH THEM, YOU'RE APT TO GET AN ENGINE CUT-OUT . . .
SPUT!
. . . OR TO WASTE SOME PRECIOUS GULF AVIATION GASOLINE
GULF

LETTERS

Stall Warning Skeptic

Some of us are getting tired of this hullabaloo about stall warning devices. Most is backed up by statistics that the majority of crash deaths are due to "spin-stall" accidents, but I have not seen one statistic showing how many of these spin-stall accidents could have been prevented by a stall warning device.

It is my personal opinion, and I would be interested to have someone disprove it, that the majority of spin-stall accidents occur because the pilot has placed himself in a position where a warning signal from a horn would simply serve to further indicate to him that he was beyond hope and that a crash was inevitable.

A close study of spin-stall accidents indicate that the pilot had a choice of controlling his reflexes and crashing the plane or stalling in desperation and hopelessness.

What we need is an "accident-warning device" to be attached to the brains of pilots which will automatically restrain any surge of ego and/or desire to try to make an aircraft do what it was never designed to do.

A close study of the aircraft accidents involving spin-proof airplanes will show, as Fred Weick will no doubt readily admit, that even a spin-proof airplane is unsafe in the hands of the pilot who cannot or will not learn. Why doesn't someone publish a comparison of frequency crash accidents in spin-proof airplanes as compared to spinnable aircraft? If you modify these figures according to aircraft sold, I feel certain you will be quite surprised at the result.

It is an old saying that "it is not the rate of descent but the sudden stop upon hitting the ground" that does the damage. For the inexperienced pilot, the rate of descent, dead stick, of any "spin-proof airplane" I have flown could and does present as much hazard at low altitude as the spin-stall characteristics of the conventional plane.

J. Robert Chapman
Branch Manager—Kansas City Office
Associated Aviation Underwriters
Kansas City 6, Missouri

More About Titanium

Those of us who read "Titanium Groomed for Future Aero Role" Feb. 21 in Aviation Week . . . were unanimous in the opinion that it is an excellent article on the new titanium development . . .

In the second paragraph, a statement is made that titanium sells for $3 per lb. To our knowledge, the lowest price at which pure titanium is available is $5 per lb. for the sponge form as sold by the E. I. du Pont de Nemours Co., Inc.

Small samples of titanium sheet and bar are being made available free by Remington for evaluation of promising applications.

Our experimental production costs are such that it is now necessary for us to charge $25 per lb. for the metal where appreciable quantities are acquired.

We expect to reduce the price of tita-

7 Reasons

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(.010" to ½" O. D. MAX.)

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If you are going to machine, thread, flare, bend, slit, or flatten Superior Carbon Steel Tubing—it comes to you ready to be fabricated. Used for spacers, bushings, machine parts, hydraulic and pressure lines, punches, valve parts, aircraft structures, electrical appliance components and condensers of all types.

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Standard or special tempers and tolerances are a part of our day's work—for Superior is a "small" tubing mill—producing in every day fashion what some mills consider premium "specialty" tubing.

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Compare Superior smooth surface finish and see the difference. A 3" sample will be furnished upon request, for your inspection.

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To meet every requirement of your specification, Superior produces tubing in the following carbon steel analyses:

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MT 1010	MT 1020	MT 1075
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*MTs—Mechanical Tubing, AISI Designation

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Superior distributors carry at all times standard analyses and sizes in warehouse stocks for immediate delivery. We'll gladly put you in touch with them.

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Every foot of Superior Carbon Steel is made to specifications—the mill carries no finished stocks. Production is prompt and flexible, and supplements distributors' stock to your advantage—there is no need to accept a substitute when you specify Superior Carbon Steel Tubing.

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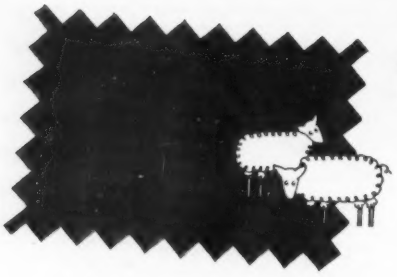

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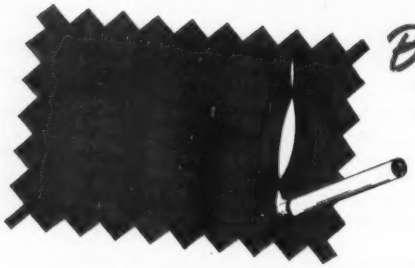

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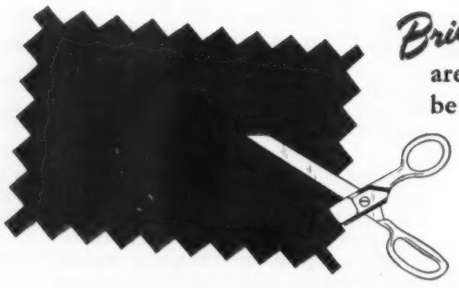

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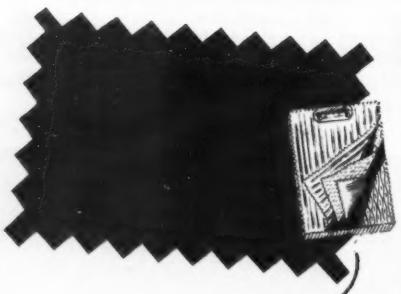

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E. L. Wemple, Development div.
Remington Arms Co., Inc.
Bridgeport 2, Conn.

Taxpayer Talks

For your editorial, "Cream Skimming and Progress," congratulations. I have spoken before about my admiration for Aviation Week and its editorials. . . .

Such things as facing ALL seats toward the rear of the ship, in view of conclusive studies in deceleration, standardization of cockpits, instrument positions, entry way; equipment trusts and interline usage of aircraft between carriers to match their peak and slack periods, consolidation of downtown terminal facilities, etc. are all so obvious in the safety and economic advantages, that we lose patience with the "big" operators and become touchy taxpayers.

Ben F. Harris
Taynor-Harris Aviation Service
Champaign, Illinois

Defends The Blimp

Reference May 9 Aviation Week, Letter to the Editor from Bob Sibley, Aviation Editor, Boston Traveler, entitled "Hunter Killer":

. . . I believe if Mr. Sibley was a little better informed on the views of the renowned Adm. C. E. Rosendahl, I am sure he would realize the "blimp" during World War II was never intended to "fight it out" with a surfaced sub.

Having flown as pilot and crewman with a blimp squadron for some 1500 hr. from November, 1942, until December, 1944, I know that no blimp pilot was ever expected to attack an enemy sub on the surface—unless it was submerging or surfacing.

The blimp was used, and I feel certain will continue to be used, as a moving observation platform. I am as certain that their very presence over waters frequented by enemy subs during World War II did much to keep them below the surface and away from coastal shipping lanes, and the kids flying them from the Mediterranean to the Pacific knew what their mission was.

If blimps are operating from carriers now, I am sure their mission is for economical reconnaissance and to contact the carrier for fighter support in case of contact. Therein the title, "Hunter Killer" is justified, since the blimp does the "hunting" and by calling the fighters and bombers in for attack, effects the "kill".

I am as optimistic as the admiral, and am behind him 100 percent for the furtherance of the lighter-than-air program.

R. E. Busby, Lt. (jg) USNR
378 Kipling Avenue
San Antonio 10, Texas

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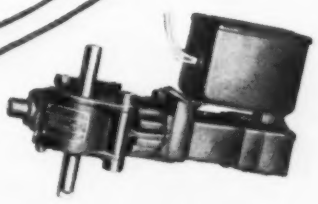
Motor inline with screw. Magnetic clutch. Radio noise suppressors. Travel limit switches. Weight, 14 lbs. Normal load, 2500 lbs. Rate of travel, half-inch per second.

STABILIZER ACTUATOR, Linear Type
Magnetic clutch, radio noise suppressors. Normal load 2500 lbs. Maximum load, 8,000, static, 20,000 lbs. Stroke 7-1/2 in. Rate of travel, .62 inches per second. Weight, 17 lbs. Non-jamming end stops.



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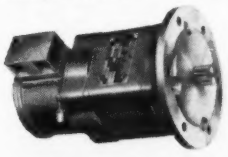

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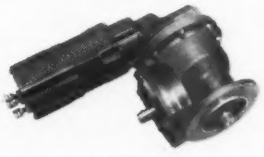

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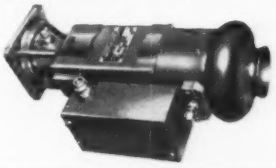

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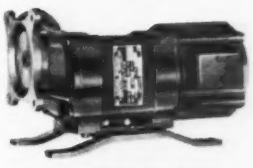
Open through ventilated for continuous duty. 3-3/4 H. P. continuous. Equipped with radio noise filter and integral gear reduction . . . Weight, 23-3/4 lbs.



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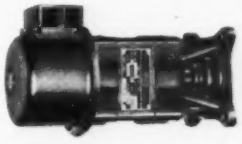
Intake and exhaust ducts for external air cooling. Continuous rating of 4 H.P. with a ram of 12-inch head of water pressure; 2-1/2 H.P. when drawing its own air for cooling. Intermittent peak output, 7 H.P. 27 volts, 9000 R.P.M. Weight, 19-1/4 lbs.

DRIVE MOTOR FOR RADAR SCANNER
400 watts output continuous. 12,000 R. P. M. reversible. 600 watts peak load. Weight, 4-1/2 lbs.

PILOT SEAT ACTUATOR MOTOR AND CLUTCH
30 second duty cycle, 1/2 minute out of 10 minutes at 95 watts output. Weight, 18 oz. Specifications can be varied to suit special conditions.



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Open through ventilated for continuous duty operation. Integral gear reduction. Weight, 12 lbs. 2 H. P. continuous rating.

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XLO

49-6

PRODUCTION

More Magnesium Facilities Sought

Expanding need in aircraft production, creating threat of critical shortage, moves government to action.

Rapidly expanding military aircraft production has stirred the Munitions Board into action to avert a threatened shortage in magnesium. Most critical shortage is expected to be in rolled magnesium sheet.

Recent developments:

• **Government sale** of its magnesium production plant at Freeport, Tex., to Dow Chemical Co. Deal was being closed between Dow and Federal Works Agency with Munitions Board approval despite strong objections from the Justice Department on antitrust grounds.

• **Overtures by U. S. Air Force** to Aluminum Co. of America to re-open its magnesium sheet mill at New Kensington, Pa. The mill was closed two years ago after suffering heavy losses due to light demand for magnesium sheet.

Munitions Board officials pointed to the rapidly expanding military aircraft manufacturing industry and the increasing use of magnesium in high speed military planes and turbojet engines as the cause of the impending shortage of that metal. Official estimates indicate that between 10 and 20 million pounds will be needed by the aircraft industry during the next two years.

▶ **Dow Role**—Dow built the Freeport mill for the government in 1941. Operations were interlocked with its own mill at the same place. Each produced 20 million pounds of virgin magnesium a year. Two years ago, Dow bought parts of the government operation, the power plant and some buildings, but it hesitated to buy the mill because of possible antitrust charges.

The government facilities are so interrelated with those of Dow's that industry experts agreed it would have been impracticable for anyone other than Dow to operate the government plant. When the Munitions Board urged Dow to take it over, Dow insisted on the sale being cleared by the Justice Dept.

The Justice Dept. took the position that no criminal violation would result from the sale, but that it would be contrary to various antitrust rulings. The Munitions Board decided that the national interest required that Dow buy and operate the plant and, it is reported, got White House backing for the sale of the plant.

▶ **Payment Plan** – Dow paid $608,000 cash and will make other payments based on production. At the end of five years, if the plant produces the expected 20-million pounds a year, the government will recover $1,980,000.

This will double Dow's capacity for magnesium production, since the capacity of its own plant is about the same as the one just obtained from the government.

Alcoa got out of magnesium sheet rolling when it closed its New Kensington mill after losing money for six months. The plant has been dismantled and the personnel reassigned. Alcoa is reluctant to reopen the plant in view of the high cost of re-assembling its equipment and personnel. FWA estimates it would cost $25 million to start a new small rolling mill. FWA thinks some aluminum rolling mills might be converted to magnesium. The industry is skeptical of that.

The only magnesium sheet mill the government had during the war was run by Revere Copper and Brass. The government built it in Revere's Baltimore plant. After the war, Revere leased the equipment, but gave up after losing $2 million. The capacity is about the same as at Dow's Midland mill.

Government experts report a shortage of magnesium fabrication as well as sheet rolling facilities.

New AF Office

A new field office for northern California manufacturers interested in Air Force contracts is being established at Oakland. Capt. James H. McMahon, Jr., officer-in-charge, and A. P. Burleaud, production expediter, will head the office.

Factories seeking contracts must be approved by this office to bid. It is affiliated with Los Angeles regional procurement field office of Air Materiel Command.

SABRE PRODUCTION ROLLING

Inspection line of North American Sabre (F-86A) jet fighters undergoing final check before delivery to the Air Force. First Fighter Group at March AFB, Calif., has already flown 1000 hr. in Sabres. Fourth Fighter Group from Andrews AFB, Md., will be the second outfit to get Sabres with the 31st Fighter Group at Albuquerque, N. M., next in line.

Copters Abroad

A lack of foreign-built craft gives Bell chance to widen export sales.

Helicopter export market made fertile by lack of suitable homebuilt craft, is being heavily developed by Bell Aircraft Corp.

Latest shipment figures: 56 model 47s (24 percent of total domestic and foreign sales) to 12 countries in South America, Europe and the Far East.

One big reason for foreign acceptance of the helicopter is the craft's natural utility for crop dusting, agricultural work and insect control in areas which ordinarily could not be reached easily. Foreign countries are using copters in regions where the soil has been either neglected or entirely overlooked because of inaccessibility or lack of proper equipment.

▶ **Disease Control**—In some countries, aside from its agricultural functions, the copter is used to spray insect-infested areas—a job which previously was accomplished by hand, and only in places that could be reached by ground transportation.

Bell has exported three 47D-1s under the Marshall Plan—two to the Ministry of Agriculture, Rome, Italy; one to Cooperative Helicoop, Paris, France.

Italy's copters will be used first in a two-team attack on malaria on the island of Sardinia. Then they will be put on spraying and dusting operations, particularly on central Italy's olive trees. All three copters were airfreighted by Seaboard and Western Airlines.

Bell made its first foreign delivery in January, 1947, to Aktiebolaget Hans Osterman in Stockhom, Sweden. Since then Osterman has purchased four additional Bell copters for agricultural and geophysical work and carrying air mail.

▶ **Argentina First**—Biggest foreign purchaser is Argentina, with Trabajos Aereo y Representacion (TAYR), Buenos Aires, receiving 13 copters for insect control (they were used successfully in combating the Argentine locust plague), and the Argentine Naval Commission ordering six for military use.

Foreign shipments: Argentina, 19; Brazil, 5; Colombia, 2; England, 3; France, 3; Iceland, 1; Iraq, 2; Italy, 2; Mexico, 3; Sweden, 5; Canada, 9; Philippines, 2.

Bell is continuing its program of training pilots and mechanics for helicopter aperation, and also to the various countries to train nationals.

Seibel Copter Flying CAA Tests

Seibel helicopter Model S-4 is flying at Wilson field, Wichita, Kans., for certification tests by the Civil Aeronautics Administration, Charles Seibel, president of the developing company has disclosed. In above photo, test pilot John Gibbs is at the controls.

The new machine incorporates many improvements over earlier experimental ships (Aviation Week, Nov. 3, 1947). It is bigger and sturdier than the S-3 model which took almost two years to build and was flown here more than a year ago.

▶ **Two-Place**—The S-4 will carry two men with basic certification being obtained on the flying frame model. Various arrangements of removable panels or a fuselage will be made to furnish shelter for the pilot, for a stretcher if it is to be used for rescue work, or for numerous other uses.

Seibel Helicopter Co., Inc., is believed to be the only company in Kansas which has developed and flown a helicopter. Seibel said his company intends to go into production with the S-4 when it is certified. Tests are expected to be completed in the fall.

▶ **$20,000 Price**—It will sell for half the price charged by competitors, the cheapest helicopter on the market (Hiller) now costing $19,995. The S-4 has a supercharged engine and will operate up to 10,000 ft.

Cargo space under the engine is large enough to accommodate a man prone on a stretcher. Loading can be performed from the rear or either side, and the plane will accommodate a reel for laying communication lines across inaccessible terrain; can be used for crop spraying, photography and special projects.

Canadair Readying Raider Production

Canadair Ltd. hopes to start tooling for its license-production version of the Northrop Raider in a month or two, and estimates are that the first plane will be in the air within a year.

Canadian experts are enthusiastic about the Raider, and they think it may well turn out to be the "streetcar of the air" for workers in the northern wasteland. As one official put it: You can fly the plane in anywhere, land on a dime, bring out the bulldozer you are carrying on board, then shovel yourself an airfield.

▶ **New Plant for F-86**—Canadair's version of the F-86, also to be produced under license, will not be manufactured in the Montreal company's present plant but in a nearby plant belonging to Canadian Car & Foundry Ltd., where the Norduyn Norseman was previously produced.

Despite these new commitments, Canadair is not calling a halt to production and sale of the Canadair Four. Company will stay on a stand-by basis even if no new orders are received before completion of the British Overseas Airways Corp. order by September, 1949, three months ahead of schedule. Parts have been made in anticipation of future orders.

▶ **Still Hope**—So far, Canadair salesmen have been unable to secure new contracts for the Canadair Four. But the company believes Britain will need another 10-12 aircraft to replace the Tudors which would have taken care of South American traffic. Other prospective buyers may be found in Italy and Australasia, and Canadair is confident they will eventually get more orders.

The Canadair Fours delivered to BOAC weigh 1800 lb. less than contracted weight, which means a corresponding increase in payload. Landing weight of the Canadair Four has been increased by 1000 lb., so that the overseas version of the craft, as flown by BOAC, has a payload of 14,000 lb.

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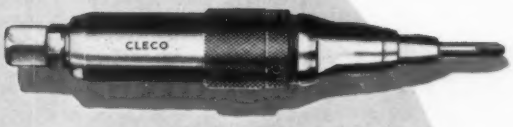

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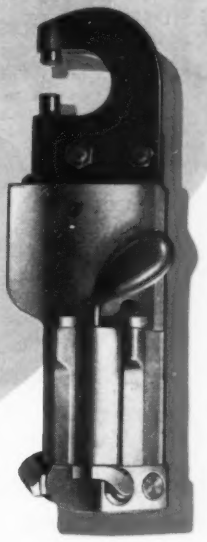

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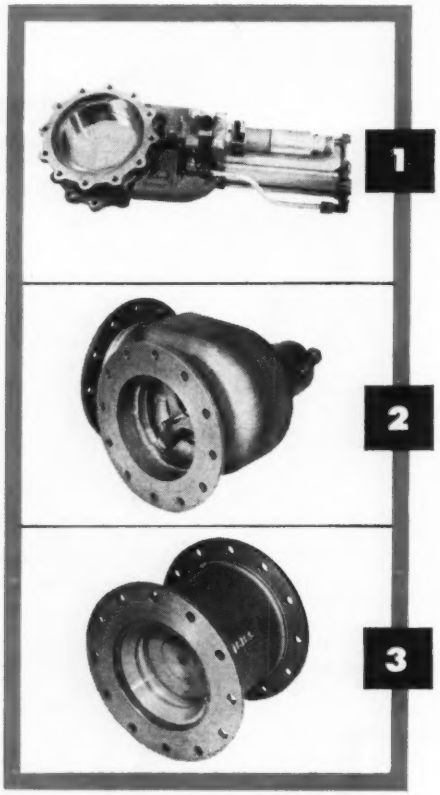

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Time from closed to open position (or open to closed position) *½ second.*
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Burbank, California
500 Fifth Avenue, New York, N.Y.

PRODUCTION BRIEFING

▶ **Independent Pneumatic Tool Co.** has built new branch sales and service buildings at New York, Pittsburgh, Chicago and Toronto.

▶ **Simmonds Aerocessories, Inc.**, Tarrytown, N. Y. will close down for its annual vacation period between July 29 and Aug. 15.

▶ **Irving Air Chute Co.** will double employment in its Ft. Erie, Ont., plant as a result of about $2 million in new orders from U. S. and Canadian governments.

▶ **Hamilton Standard Propeller** division of United Aircraft Corp., East Hartford, Conn., has changed its name to Hamilton Standard division.

▶ **Moore-Eastwood Co.**, Dayton, makers of aircraft parts, have purchased the Auto Compressor Co. building in Wilmington, Ohio, and will move to the new location in the fall.

▶ **Champion Spark Plug Co.** expansion of aircraft spark plug production to meet service and airline orders has caused an increase in employment at the Toledo plant.

▶ **Luscome Aircraft Corp.**, Dallas, is prime contractor for the Lynbrook "Magic" Dishwasher and have designed the washer for mass production. It sells for $49.50.

WHO'S WHERE

Hamilton Standard propellers division of United Aircraft Corp., East Hartford, Conn., transferred Frank C. MacTernan to Los Angeles office of United Aircraft Service Corp. to be assistant to A. H. French, West Coast representative of Service Corp. for propeller division. Before his promotion, MacTernan was senior sales engineer for Hamilton Standard.

General Electric Co. appointed C. W. La Pierre assistant manager of the Aircraft gas Turbine division at Lynn, Mass. He was vice president-engineering of American Machinery and Foundry Co.

Beech Aircraft Corp. appointed E. S. Safford to the newly-created position of director of sales, at Wichita. Safford has been manager of the Beech export sales department.

Adel Precision Products Corp. elected Fred T. Miller and R. A. Stumm, Jr., vice presidents. Miller, previously general sales manager, was named vice president-engineering and sales at Burbank Stumm, former assistant to the president, was named vice president-manufacturing at the Burbank division.

Latest Air Force Bid Awards

Air Materiel Command procurement Division makes available to AVIATION WEEK the latest bid awards, shown on this page. Requests for further information should be addressed to Contracting Officer, AMC, Wright-Patterson AFB, Dayton, Ohio, attention: MCPPSX72, (AMC will resume in July the issuance of data on invitations for bids.)

ABSTRACTS

For duck tarpaulin (49-1320):
Springfield Tent & Awning Co., Springfield, O., on a bid of $20,901.90.

For 23,376 quarts synthetic rubber cement (49-1428):
B. B. Chemical Co., Cambridge, Mass., on a bid of $15,778.80.

For bushing mounting (49-1488):
Companies sharing—Lord Mfg., Co., Erie, Pa., on a bid of $19,100, and Dow-Elco, Inc., Los Angeles, on a bid of $12,125.

For aircraft stands (49-1500):
Hammond Mfg., Corp., Huntington Park, Calif., on a bid of $138,278.

For fabric tester (49-1509):
B. F. Perkins & Sons, Inc., Holyoke, Mass., on a bid of $37,800.

For gun assemblies (49-1552):
Neal Machine & Tool Co., Lima, O., on a bid of $7715.52.

For gasket assemblies (49-1557):
Companies sharing—Diamond Metal Products Corp., Blairsville, Pa., on a bid of $25,386.50; Aro Equipment Corp., Bryan, O., on a bid of $2757.65; Mitchell Metal Products Inc., Cleveland, on a bid of $3220; Cleveland Steel Barrell Co., Cleveland, on a bid of $13,500, and Steel Drum Pkg. & Accessories, Inc., Cleveland, on a bid of $34,230.

For rectifiers (49-1593):
McColpin-Christie Corp., Los Angeles, on a bid of $16,259.40.

For testers (49-1621):
Companies sharing—Detroit Testing Machine Co., Detroit, on a bid of $2750, and Skyway Precision Tool Co., Los Angeles, on a bid of $18,350.

For connectors (49-1635):
Grand Machining Co., Detroit, on a bid of $9438.

For pump assemblies (49-1719):
Thompson Products, Inc., Cleveland, on a bid of $245,726.25.

For gasket assemblies (49-1748):
Companies sharing—Diamond Metal Products, Blairsville, Pa., on a bid of $31,671; Rheem Mfg. Co., New Orleans, on a bid of $10,413.70, and Steel Drum Pkg. & Accessories, Inc., Cleveland, on a bid of $30,230.

For photographic film (49-1754):
Companies sharing—E. I. du Pont De Nemours & Co., Inc., on a bid of $7001.67, and Eastman Kodak Co., Rochester, on a bid of $17,284.16.

For water distillation kits (49-1817):
Breslee Mfg. Co., Inc., New York, on a bid of $27,792.

For magnet timing lights (49-1843):
Electric Heat Control Co., Cleveland, on a bid of $8814.74.

For ball bearings (49-1847):
Companies sharing — Marlin-Rockwell Corp., Jamestown, N. Y., on a bid of $13,984; Barden Corp., Danbury, on a bid of $25,850; Ahlberg Bearing Co., Chicago, on a bid of $2650; General Motors Corp., Bristol, Conn., on a bid of $2040, and Norma-Hoffman Bearings Corp., Stamford, on a bid of $126.

For vulcanizing cement (49-1851):
Polymer Chemical Co., Cincinnati, on a bid of $3610.

For plastic sheets (49-1959):
Monsanto Chemical Co., Springfield, Mass., on a bid of $3202.50.

For mounting & bushing assemblies (49-1962):
Lord Mfg. Co., Erie, Pa., on a bid of $11,520.

For adhesive (49-1996):
Paisley Products, Inc., Chicago, on a bid of $7170.60.

For various chemicals (49-1999):
Companies sharing — Octagon Process, Inc., Brooklyn, on a bid of $1047.50; B. R. Elk & Co., Inc., Garfield, N. J., on a bid of $1570, and City Chemical Co., Newark, N. J., on a bid of $2220.

For variable transformers (49-2005):
Allied Radio Corp., Chicago, on a bid of $3647.

For two target motor assemblies (49-1344):
Companies sharing—Aerial Machine & Tool Corp., Long Island, N. Y., on a bid of $55,975, and Irving Air Chute Co., Inc., Buffalo, on a bid of $19,750.

For 6200 ball bearings (49-1410):
Companies sharing — General Motors Corp., Bristol, Conn., on a bid of $922.50; Marlin-Rockwell Corp., Jamestown, N. Y., on a bid of $950; Ahlberg Bearing Co., Chicago, on a bid of $590, and Norma-Hoffman Bearings Corp., Stamford, Conn., on a bid of $1357.

For photographic equipment (49-1483):
Companies sharing—Simmon Brothers, Inc., Long Island, N. Y., on a bid of $6012.40; Graflex, Inc., Rochester, on a bid of $177.50; Neumade Products Corp., New York, on a bid of $264, and Radiant Mfg. Corp., Chicago, on a bid of $33.

For oscilloscope & technical data (49-1508):
Allen B. Du Mont Laboratories, Inc., Clifton, N. J., on a bid of $4873.50.

For excluder assemblies & plug assemblies (49-1563):
Woolam Aircraft & Marine Products Co., Collina, O., on a bid of $6518.41.

For sodium sulphite, ammonium chloride, etc. (49-1584):
Companies sharing—Miami Products & Chemical Co., Dayton, on a bid of $1000; Octagon Process Inc., Brooklyn, on a bid of $1685.60, and Industrial Distributors, Inc., New York, on a bid of $712.

For various chemicals (49-1624):
Monsanto Chemical Co., Everett, Mass., on a bid of $11,410.31.

For 75,000 feet cables (49-1626):
General Cable Corp., Cincinnati, on a bid of $20,625.

For case assemblies, lens, background, etc., (49-1643):
Companies sharing—Bell & Howell Co., Chicago, on a bid of $216; Hubbell & Miller Co., New Rochelle, N. Y., on a bid of $8120; Philadelphia Air Transport Co., Norristown, Pa., on a bid of $300; Perry Products Co., New York, on a bid of $1625; Graflex, Inc., Rochester, on a bid of $146, and Fiberbilt Sampler Case Co., Inc., New York, on a bid of $2954.

For blasting grit (49-1749):
Maderia Food & Materials Co., Tulsa, on a bid of $15,786.

For metal covers (49-1752):
Companies sharing—Diamond Metal Products Corp., Blairsville, Pa., on a bid of $12,945; Rheem Mfg., Corp., Bryan, O., on a bid of $856.77, and Steel Drum Pkg., & Accessories, Inc., Cleveland, on a bid of $13,402.50.

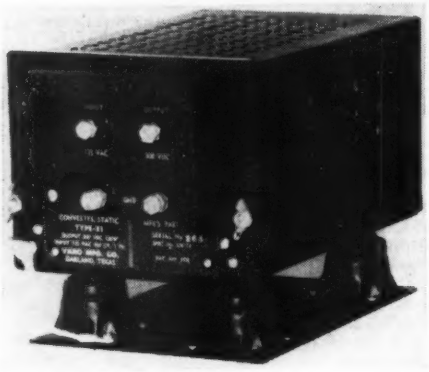
For developing equipment (49-1831):
Morse Instrument Co., Hudson, O., on a bid of $8336.

For 320 safety belts (49-1961):
Mine Safety Appliances Co., Pittsburgh, on a bid of $4320.

For resistors (49-1491):
Companies sharing—Chicago Telephone Supply Corp., Elkhart, Ind., on a bid of $130.23; Standard Electrical Products Co., Dayton, on a bid of $2167.76; Concord Radio Corp., Chicago, on a bid of $17.26; Ohmite Mfg., Co., Chicago, on a bid of $229; Sprague Electric Co., North Adams, Mass., on a bid of $528; U. S. Radio Supply, Chicago, on a bid of $150.65; Continental Carbon, Inc., Cleveland, on a bid of $6.25, and P. R. Mallory & Co., Inc., Indianapolis, on a bid of $435.

For air hose (49-1550):
Boston Woven Hose & Rubber Co., Cambridge, on a bid of $6161.70, and Anchor Rubber Co., Dayton, on a bid of $2080.

NEW AVIATION PRODUCTS



Static Converter

D.C. electronic power supply, reported to possess unusually good control characteristics, is marketed as Model 30 converter by **Varo Mfg. Co., Inc.**, Box 638, Garland, Tex.

Device has no moving parts, is stated to operate at extreme altitudes and temperatures, and withstand extremes of humidity, salt spray, fungus and vibration.

Input is rated at 110-120v., 380 to 420 cycles, single phase, while output rating is 300v. d.c., 0 to 400 ma.

Weight is 8 lb., displacement 185 cu.in. without shock mounts. Unit is reported to meet all USAF specifications 32617 A for Type E-1 static converters.

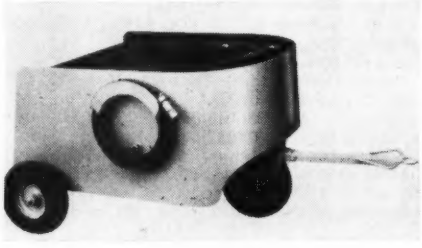
For Prop Checking

Aerodynamic balancer for aircraft propellers, known as averaging protractor, is made by **Baker Mfg. Co.**, Evansville, Wisc., for use in manufacturing or maintenance operations.

Device indicates directly best angle setting of blade in hub assembly by automatic integration, in precision computing mechanism, of measurements based on large number of points on blade surface. All sizes of blades can be measured.

Glass-Panel Heat

For hangars, dope rooms, towers, field buildings, and other work areas ordinarily presenting heating problem, "Electriglas" radiant heat panels are offered by **Appleman Glass Works**, Bergenfield, N. J. Heating element is guaranteed for life. Heat is produced by metallic alloy grid fused into curved Temprex glass. It's stated that current passing through grid generates infrared heat with 25 percent greater efficiency than comparable radiant heating systems. Either permanent or portable models are available. Installation costs on permanent units are claimed to be low, since panels can be connected to a.c. or d.c. 110 or 220v. circuits without tearing out walls or partitions.



Engine Pre-Oiler

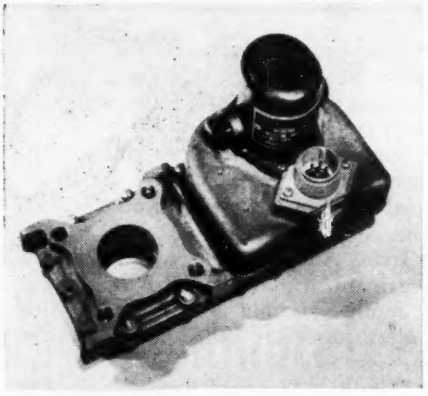
Aircraft engine pre-oiler for jet and conventional planes, offered by **Harman Equipment Co.**, 3605 E. Olympic Blvd., Los Angeles 23, Calif., consists of a tank body, trailer pumping unit and heating equipment.

Heaters are equipped with electric controls, including pilot light indicating "on" and thermostat for oil temperature.

Storage accommodates 20 gal. in sump and 60 gal. for dispensing. Pumping capacity is 10 to 15 gpm. Tank is equipped with 6-in. hinged-type, safety fill cap with triplex vent, spring loaded to prevent excessive pressure buildup. Thermometer and liquid level gage are also included.

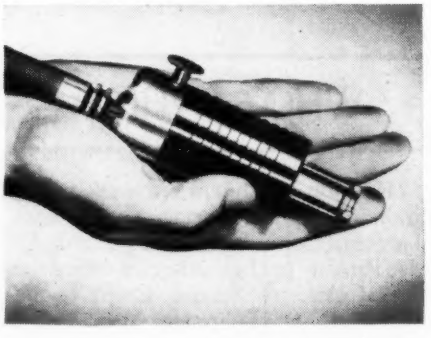
Pump unit is manifolded with three-way, three-port valve for pumping from outside storage or airplane tank into trailer tank, or from trailer tank into plane tank. Pump inlet has line strainer fitted with 100-mesh Monel basket to strain oil each time it goes through pump, regardless of operation.

Non-skid type work platform is equipped with service doors for easy access to fill-cover, liquid level gage, thermometer, pilot light, thermostat and pumping unit. Equipment includes 25 ft. of 1-in. discharge hose and 50 ft. of heavy-duty, rubber-covered cable. Overall dimensions are 40 wide x 60 long x 36 in. high.



Fuel Valve

Unqualified yellow dot approval on No. 6400 motor-operated 1¼ in. aircraft fuel shut-off valve is announced by **Saval, Inc.**, 1915 E. 51st St., Los Angeles 11, Calif. Designed for less than one-second actuation, valve features small size, light weight, interchangeability and easy installation. It operates at 18 to 30 v. d.c. It also is available for use in hydraulic and engine lubricating oil systems, and for air prescure applications. Unit is designed to operate at temperatures up to 500 F.



Sheet-Holding Aid

Air plier AT-510A, developed by **Aircraft Tools, Inc.**, 2306 38th St., Los Angeles 11, Calif., for fast insertion and removal of sheet holders, is intended to boost production, minimize operator fatigue, and improve safety. Made of steel and dural, tool is designed to reach into places usually inaccessible with ordinary plier. Friction parts are heat-treated to withstand wear.

Mount gives firm positive grip, fits both shielded and unshielded types of holders, and swivels full 360 deg. Sheet holder is inserted into automatically gripping nose piece. At touch of valve button, full air pressure is applied to holder allowing it to be inserted into sheet. With button release, holder is locked in position and plier easily slipped away. Tool weighs but 12½ oz.

NEW SOUTH WIND "929" DELIVERS 700,000 BTU/HR.

Developed expressly to *save installation weight,* this highly-simplified "929" with 700,000 BTU/HR capacity is especially suited for high altitude heating and thermal anti-icing of wing and tail assemblies.

★For Maximum Safety

the South Wind "929" has completely separate combustion and ventilation systems with individual air sources. The hermetically-sealed flame in the jet-type burner requires no air or fuel regulation, even under widely varying conditions. Makes possible the lowest outside case temperatures ever achieved in combustion-type heaters. And only South Wind has the exclusive built-in Flo-Switch that automatically shuts off heater operation if the air flow falls below a predetermined level.

★For Peak Efficiency

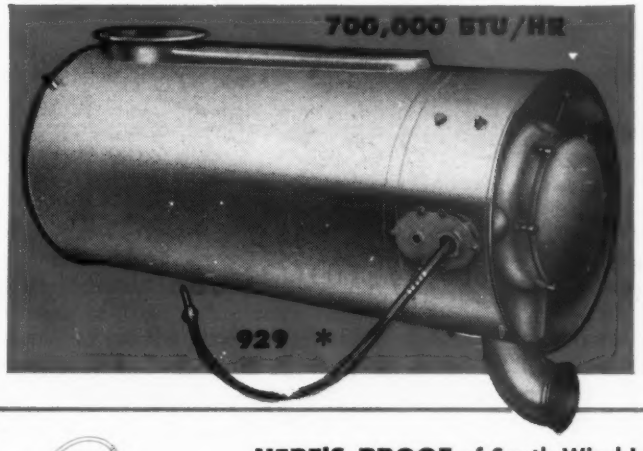
the "929" features highly simplified design to give *more heat per installation pound!* Both installation weight and cost are cut by elimination of duplicate thermal switches, fuel valves, etc., required in multiple installations of smaller-capacity heaters. The standard low stack and metal temperatures at peak operation are typical of South Wind heater design. The shielded spark plug insures automatic gap maintenance and prevents fouling. Fuel drains *at both ends* allow efficient, positive drainage *regardless* of the aircraft's attitude.

★For Easy Maintenance

the spark plug and nozzle are readily accessible *through* inspection ports provided in the "929" heater-case. The entire burner assembly is designed for rapid removal, service and re-installation.

★Adaptable to Any Type Aircraft

the complete line of South Wind heaters offers highly simplified design to solve heating problems in commercial, military and civilian aircraft. South Wind production facilities can now satisfy all delivery requirements on heaters from 20,000 to 700,000 BTU capacities.



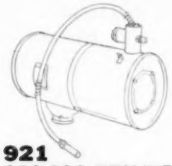
WRITE TODAY for specific model information or expert assistance on your aircraft heating problem. South Wind Division, Stewart-Warner Corporation, Indianapolis 7, Indiana.

South Wind

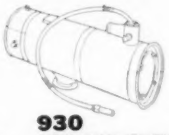
Another Product of STEWART WARNER

AIRCRAFT HEATING AND THERMAL ANTI-ICING EQUIPMENT

HERE'S PROOF of South Wind Leadership in the Nation's Finest Aircraft!

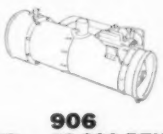


921
200,000 BTU/HR
Boeing B-50 Martin P4M
Boeing B-47 Martin 2-O-2
Boeing C-97 Beech 34
Lockheed P2V Series
Boeing 377 "Stratocruiser"
North American P-82
Grumman XJR2F-1
*

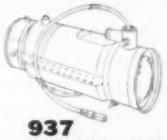


930
100,000 BTU/HR
Boeing B-29
* Boeing B-50
Martin P4M

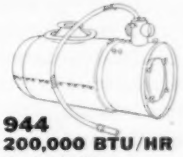
917
25,000 BTU/HR
Grumman F-6-F
Boeing B-50
*



906
50,000 BTU/HR
Martin PBM
Grumman TBF
Navy TBM
Consolidated PBY5-A

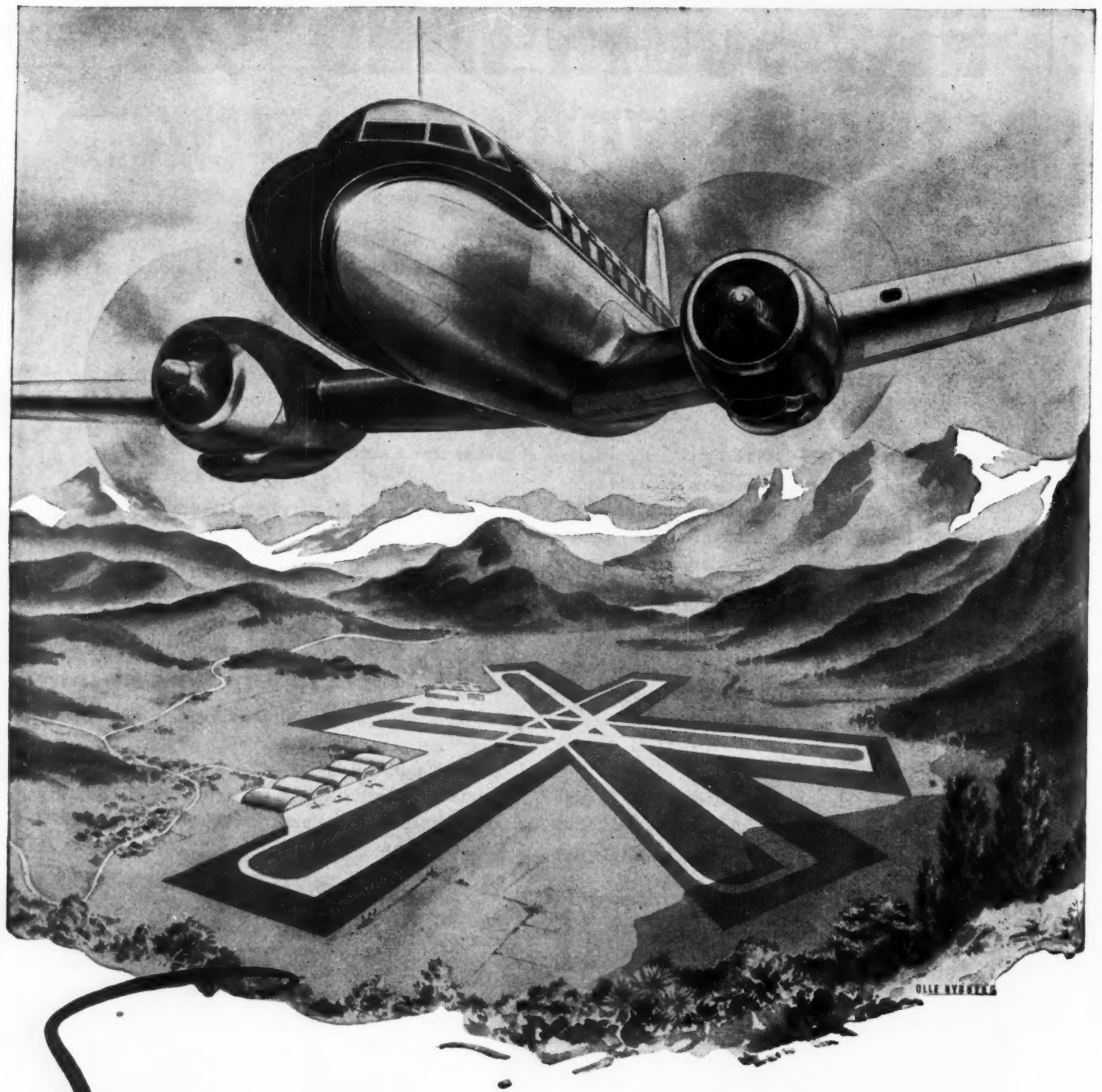


937
100,000 BTU/HR
Boeing B-29
Boeing B-50
*



944
200,000 BTU/HR
Boeing B-50
Boeing C-97
Boeing 377 "Stratocruiser"

*New aircraft not released from military censorship.



Scandia takes off...

with perfect safety even from small and obstructed airports.

Moderate wing loading in combination with outstanding aerodynamic design gives the Scandia extraordinarily good take-off and landing qualities.

Thanks to the great excess power and the excellent high altitude performance of the engines it is also possible to operate the Scandia from high altitude airports without any large increase in take-off and landing runs.

In short, the Scandia is an ideal passenger plane for continental routes — in all parts of the world.

PERFORMANCE

All figures refer to standard atmosphere

	Airfield altitude: Sea level	5,000 ft
Max. take-off weight *CAR runway length for take-off*	32,408 lbs *3,690 ft*	30,650 lbs *5,055 ft*
Max. landing weight *CAR runway length for landing*	31,967 lbs *2,950 ft*	29,700 lbs *3,070 ft*
Stalling speed (T.A.S.)	78 MPH	83 MPH
CAR 180° min. turn radius (completed in 15 seconds)	650 ft	

SVENSKA AEROPLAN AKTIEBOLAGET • SAAB AIRCRAFT COMPANY • SWEDEN

Relative Market Action

Company	1947 Low	1948 High	Close June 6, 1949
Beech	4*	10*	6¾
Bell	11	19¾	14
Boeing	14	29½	18½
Convair	11	16⅜	8⅛
Curtis-Wright	4	12½	8⅛
Curtiss Wright "A"	13	28¼	20
Douglas	45	67⅞	56
Fairchild E & A	4	5⅞	4⅛
Grumman	9	25⅜	16
Lockheed	11	24⅝	17⅛
Martin	14	22⅜	8¼
North American	7	13⅜	8¾
Northrop	5	13⅞	6
Republic	4	13⅜	4⅞
United Aircraft	17	30⅝	21¼

Note: No adjustments made for cash dividends paid.
All fractions omitted for 1947.
**Adjusted for stock split-up.*

Decline Noted in Aircraft Shares

Analysis of influencing factors shows equities resist general market trend and continue above 1947 lows.

Along with weakness in the general market, aircraft equities suffered new declines for the year in the recent selling waves. It is significant, however, that while the general market averages established a new low since 1946, most aircraft shares, despite their sharp declines were still selling above their lowest 1947 points.

As a group, aircraft shares have been in a downward trend since mid-1948.

The current controversy surrounding the proposed investigation of the Convair B-36 affects more than the individual company involved. The entire aircraft industry is concerned, as controversies of this nature may have a tendency to cut the general level of aircraft appropriations.

The accompanying table illustrates the market positions of leading aircraft equities at their 1947 low, 1948 high and recent levels. These periods represent significant milestones and further reflect the shifting fortunes of the individual companies. Selectivity of pattern in market movements is a definite characteristic of separate aircraft shares.

Generally, postwar peaks were established during 1946. This was a manifestation of strong financial conditions, built by war orders and optimistic predictions, in some quarters, of a strong continuing demand for military and commercial planes.

As backlogs diminished and resources, in many instances, were dissipated through ill-advised extraneous ventures, a great deflation took place in the market prices of aircraft shares. This low estate, for the group, was reached early in 1947.

The current market action for aircraft shares appears to be more concerned with future prospects and less with the existing financial conditions of the separate companies.

▶ **Working Capital**—Such manufacturers as Douglas and Grumman, for example, have working capital far in excess of the market quotations for their shares. Douglas at present remains about midway between its 1947 low and 1948 high, but more than 53 points below the all-time peak of 109 recorded in 1946.

Grumman, which has maintained a consistent reputation as a top-quality company in the aircraft industry, also has shown better than average resistance to the recent selling waves. The shares of this company are about 45 percent above their 1947 low and only 38 percent off the all time peak prices of 1946 and 1948.

Bell, which was approaching its 1947 low, received a sharp shot in the arm and rose 1½ points in a weak market as a result of an offer by its controlling interests to buy additional shares.

Market appraisal of Boeing has been quick to reflect the decline in fortunes of that company resulting from a series of cancellations imposed by the services. Despite these reductions, Boeing remains with the largest backlog of orders. Nevertheless, such cancellations cause apprehension among shareholders who do not always wait to place the company's position in proper focus.

▶ **Market Performance**—Consolidated Vultee and Glenn L. Martin have the least attractive market performances among the aircraft builders.

Convair is selling at a full 3 points below its 1947 low and is only one-third of the price prevailing at the peak of 1946. The Atlas Corp., until recently, has been a consistent purchaser of Convair stock and remains the dominant stockholder. At present quotations, a material book loss is evident in the holdings of Convair by Atlas.

The Glenn L. Martin Co., hurt by its commercial transport program, has suffered a decline of almost 80 percent from its peak price of 41, recorded in 1946, and is off some 43 percent from its 1947 low.

Actually, Republic Aircraft, in terms of the decline from its 1946 peak, has had the same sharp drop of about 80 percent, but remains around its 1947 low.

The lack of uniformity in market moves among the aircraft shares highlights the changing outlook for the separate units. Realistic market observers attempt to appraise these shifts and improve their positions by adjusting their investments.

▶ **Selectivity**—For example, only last year, when both North American and Republic were selling at about the same levels, it would have been desirable to have sold the latter and purchased shares of the former. While it is true that a market loss also was experienced by North American, it was far less than that shown for Republic.

By the same token, an all-knowing aircraft investor would have done well to have sold Convair and purchased Beech. In this manner, instead of a 50 percent loss, only a 32 percent decline would have been experienced.

Time has shown that the really astute investor would have sold all aircraft shares in mid-1948. Nevertheless, the aircraft industry represents such an integral phase of our national economy that it is bound to attract a certain number of sophisticated investors looking for profitable commitments. As long as this condition prevails, there will always be selectivity among the separate issues.

—Selig Altschul

Another AUTO-LITE first!

NEW
18MM AUTOMOTIVE TYPE
AIRCRAFT SPARK PLUG
WITH C.A.A. APPROVAL*

Tune in "Suspense!"...CBS Radio Network Thursdays... CBS Television Tuesdays

Auto-Lite Spark Plugs—Patented U.S.A.

AUTO-LITE engineering skills have developed and perfected a new 18MM Aircraft Spark Plug with automotive type electrodes. Flyers across America are switching to this high quality, low cost aircraft spark plug made available by Auto-Lite. Money cannot buy finer aircraft spark plugs. Write for catalog.

THE ELECTRIC AUTO-LITE COMPANY
Sarnia, Ontario — Toledo 1, Ohio

*On engines as specified

There's An Auto-Lite Aircraft Spark Plug For Practically Every Type Of Commercial and Civilian Aircraft

Light plane owners and airport operators report Auto-Lite Spark Plugs for aircraft are delivering the maximum in performance and dependability. Years of experience have provided Auto-Lite with the engineering skill and production ability to build a spark plug especially suited for the exacting needs of aviation service. All Auto-Lite Aircraft Spark Plugs have C.A.A. approval for use on engines as specified.

AUTO-LITE SPARK PLUGS for Aircraft

Richard E. Seaman, Bonanza owner from Albany, N. Y., watches Beech factory service engineers J. M. Roach and R. B. Bosworth inspect his plane at Atlantic Aviation, Teterboro.

Free Service Promotes Bonanzas

Two teams of factory engineers visit distributors to make gratis inspection of all Beech four-placers.

An unprecedented maintenance and service plan by Beech Aircraft Corp. is helping to stimulate customer interest in local dealers and distributors—in addition to promoting sales of Beech Bonanzas.

Since the beginning of June two teams of factory service engineers have been visiting Beech distributors throughout the country. They inspect and make service recommendations on all Bonanzas in the territory free of charge.

▶ **Invitation**—Beech distributors send out a regular form letter to each Bonanza owner in the territory, telling him:

"We have arranged with the Beech Aircraft Corp. for several factory service representatives to be at our facility for three days (dates are written in), for the purpose of inspecting Beechcraft Bonanzas in this territory.

"This inspection will consist of a complete systematic check showing the operating efficiency of your Bonanza.

"Incidentally, this inspection has been arranged with the thought in mind of assuring satisfaction with your Bonanza and the service rendered in our Service Dept.

"There will be no charge for this inspection."

▶ **100 at Teterboro**—At Atlantic Aviation Corp., Teterboro Air Terminal, Roach and Bosworth inspected nearly 100 planes.

One Bonanza, which was piloted by Richard E. Seaman, came in from Great Barrington Airport, Mass., for the inspection.

Seaman's reaction was typical. He told AVIATION WEEK he was quite pleased with the aircraft and thought that the service plan was an excellent idea.

It seems Beech Aircraft Corp. agrees, since Roach and Bosworth indicated the company plans to make it a regular service.

▶ **Boost for Distributor**—In line with expanding customer services and strengthening the position of distributors, Beech is providing multi-colored large-sized post cards for mailing to Bonanza owners. The cards advise owners to "Bring your Bonanza back to our Beechcraft Service Station for a check-up."

The cards cite maintenance facilities, and carry the distributor's name at the bottom.

Beech will also distribute form letters to be sent out after any maintenance or repair work, which will have a perforated section to be torn off and sent to Wichita, with comments from the aircraft owner on the way the maintenance was performed, whether it was satisfactory, and so on. Company will then return these stubs to the operator performing the maintenance so he has an idea of customer reaction to his service.

▶ **Report**—Following the inspections, which are conducted in conjunction with local service personnel, the Bonanza owner receives a complete inspection report, covering engine section, tail, wings, landing gear, fuselage, cabin interior, records and log books and functional check items.

The report shows at a glance the condition of the aircraft and, where necessary, makes specific recommendations regarding repairs or improvements considered advisable by the company's inspectors.

So far, response to the service has been extremely favorable. One factory team, James M. Roach and Richard B. Bosworth, told an AVIATION WEEK reporter that a customer said he had "bought Cadillacs and a lot of machinery, but this is the first time I've heard of the manufacturer worrying about the equipment after it was bought and out of his hands."

▶ **Necks Out**—Roach and Bosworth said they left Wichita for the tour with some misgivings.

They had the thought that an idea like this would be a natural for owners to give them some arguments and present some tough questions. But so far, according to the team, the arguments have been surprisingly few, many suggestions have been made, and in three cases the team has been able to catch serious difficulties which might have led to accidents.

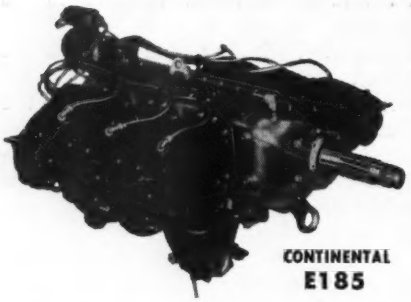
The two teams hope to have covered these distributors by July 1: Atlantic Aviation Service, Wilmington; Wings Field, Philadelphia; Atlantic Aviation Corp., Teterboro; Page Airways, Rochester, N. Y.; Ohio Aviation, Dayton.

Also Longhorn Aircraft, San Antonio; J. D. Reed Co., Houston and New Orleans; G. E. Penn, Longview, Tex.; Fabick Aircraft Co., St. Louis; Roscoe Turner Aeronautical, Indianapolis.

Also Francis Aviation, Lansing, Mich.; Butler Co., Chicago; Anderson Air Activities, Milwaukee; Gopher Aviation, Rochester, Minn.; Hunter Flying Service, Cedar Rapids; and Prairie Airways, Lincoln, Neb.

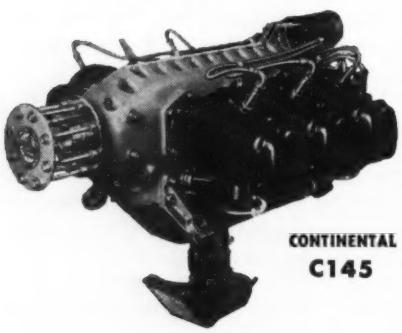
These territories contain about 1000 Bonanzas, and the two teams expect at least half this number will come in for the free inspection.

THREE TIMES AROUND THE WORLD— NON-STOP!



CONTINENTAL E185

When Barris and Riedel landed their Aeronca after six full weeks in the air, their Continental C145 had carried them the equivalent of three times around the earth without a stop! Like Capt. Bill Odom's two record-breaking flights in his E185-powered Beechcraft, earlier in the year, their achievement speaks volumes for the modern plane.



CONTINENTAL C145

STOCK ENGINES IN ALL THREE FLIGHTS

The two Continental engines which figured in these new records were stock in every respect — identical with thousands of others powering planes in everyday use. The hour-after-hour dependability so spectacularly proved in these flights is typically Continental too. That is why Continental engines are fliers' first choice.

Continental Motors Corporation

Aircraft Engine Division • MUSKEGON, MICH.

BRIEFING FOR DEALERS & DISTRIBUTORS

CLIPPER SALES UP—Best sales record for any one plane in 1949 thus far is the 129 sales which Piper chalked up in May for the $2995 four-place Clipper, more than double the sales of its nearest competitor, the Cessna four-place 170, which had 59 deliveries. Fact that Piper delivered only one four-place Family Cruiser in May might indicate that this airplane will not be marketed by Piper much longer. It's too competitive with the Clipper not to be hurt by the Clipper's success.

FIRST TEN ONE-PLACERS—Mooney Aircraft Co., Wichita, in May reported its first deliveries of 10 M-18-L one-placers. A 65 hp. Lycoming engine replaces the Crosley automobile engine which Al Mooney first used in the midget plane. Priced at $1995, the composite structure plane is credited with a 390 mi. range at 115 mph. cruising speed, and a 40 mph. landing speed. It is equipped with a trim indicator which is a further development of the Mooney Simpli-fly control used on the Culver Model V. It coordinates movement of the entire tail of the airplane, with the flap in trimming for landings. Tricycle gear retracts manually. Plane weighs 500 lb. empty and carries 280 lb. useful load.

CROSSWIND GEAR OPENING—Lloyd Child, CAA personal flying specialist, points out that wind limitations announced on the Chicago lakefront strip on Northerly island, when the strip was under construction, do not apply for planes equipped with castering landing gear for crosswind landings. Operational limitations for any planes on the strip because of wind are locally imposed and not a CAA requirement, Child states.

AVIATION EDUCATION SPECIALIST—Pennsylvania Aeronautics Commission has agreed to pay salary and expenses of Miss Elizabeth Warnock, aviation specialist for the state department of public instruction. She will work with the aviation interests of the state and coordinate aviation education programs for the department. First step will be a program of public school teacher aviation education in which the aviation operators will be asked to cooperate directly with the schools of their communities. A flight experience program may be a later development.

OPERATOR TICKET AGENTS—Roscoe Turner, whose new feederline with headquarters in Indianapolis is expected to start operations about July 1, wants to consolidate his local ticket sales in each stop with the fixed base operator at the airport. Turner described his plan recently in testimony before the Senate Interstate and Foreign Commerce Committee. "We will give the operator a percentage to handle the tickets and hire his personnel for the time the airplane is in there and on the ground," the former racing pilot told the committee.

MONOCOUPE DELIVERY—First 1949 Monocoupe with 14.5 gal. auxiliary fuel tank has been delivered to the Aruba Flying Club in Aruba, Curacao, Dutch West Indies. The plane was flown by club members to Aruba over a route which included 450 miles of open water. Auxiliary tank extends the plane's range to over six hours at 140 mph. cruising speed, or 800 miles. Range is believed by the company to exceed that of any other two-place model. CAA has given approval on an enlarged CG range for the airplane which permits a baggage allowance of 110 lb. plus full passenger and gas load.

GROUND BUZZERS—Washington State Aviation Assn. has announced a program among its 75 operator members to see that reckless flyers and low-flying "buzz boys" are denied further use of airplanes in the state for varying periods up to a maximum of 12 months. Operators plan to notify all other member airports when a buzz pilot is grounded at one airport.

—ALEXANDER McSURELY

SIKORSKY Helicopter NEWS

SIKORSKY AIRCRAFT
ONE OF THE FOUR DIVISIONS OF UNITED AIRCRAFT CORPORATION
BRIDGEPORT CONNECTICUT

The past few weeks marked another milestone in our history here at Sikorsky Aircraft. Our smallest helicopter, a Sikorsky S-52, was put through its paces and came up with three additional international helicopter records.

On April 27 in Cleveland, at the National Air Races course, a three-kilometer world's speed mark of 129.6 miles per hour was established. On May 6, this same helicopter flew over a 100-kilometer Closed Circuit course right here in Connecticut and set a record of 122.75 miles per hour for this distance. Then on May 21, the S-52 took off from Sikorsky's own small heliport and climbed to a new altitude record of 21,220 feet.

With these three new records Sikorsky helicopters now hold all seven international major helicopter records. In addition to the three-kilometer, 100-kilometer and altitude marks are Duration, Closed Circuit made by a Sikorsky R-5A, 9 hours 57 minutes; Distance, Airline, Sikorsky R-5, 703.6 miles; Distance, Closed Circuit, Sikorsky R-5A, 621.4 miles; Speed for 1,000 kilometers, Closed Circuit, Sikorsky R-5A, 66.6 miles per hour.

These records are something of which we are proud, of course, but the really important things are the dependability and versatility for which all types of Sikorsky helicopters have become known the world over.

Records, versatility, dependability, all are the result of the extensive research, sound engineering, thorough testing and painstaking production which is the everyday, working team that has made Sikorsky Aircraft the leader in the helicopter field.

SIKORSKY AIRCRAFT

Just what is meant by

STAINLESS

?

Some 30 alloy steels, each identified by its American Iron and Steel Institute number . . . able to thwart attacks by chemicals and atmospheres over a wide range of concentrations, pressures and temperatures...carry the family name "Stainless."

The addition of chromium in excess of 11% to steel provides, according to most generally accepted theory, a thin, adhering self-healing oxide film that protects the underlying metal. The result is a series of alloys highly resistant to corrosion and tarnishing in a wide variety of corrosive media.

Six per cent or more of nickel when added to chromium stainless steels produces a series of alloys of improved corrosion resistance known as the austenitic chromium-nickel stainless steels. Recognition by industry of this improvement is indicated by the fact that approximately two-thirds of all stainless steel tonnage produced is of the chromium-nickel type.

In the annealed condition austenitic chromium-nickel stainless steels are strong, tough, ductile and pliable. When cold-worked they are effectively strengthened and hardened; a tensile strength in excess of 200,000 p.s.i. is easily developed. Annealed, and even in the cold-worked condition, they are adaptable to many forming operations. In all conditions they are readily weldable.

At elevated temperatures, austenitic chromium-nickel stainless steels are distinguished by their strength and outstanding resistance to oxidation. At temperatures down to −300° F. they retain their toughness and unusual strength.

Other elements are sometimes added to give specific properties: to improve machinability, enhance scaling resistance, improve resistance to corrosion in specific, difficult cases.

Leading steel companies produce austenitic chromium-nickel stainless steels in all commercial forms. A list of sources of supply will be furnished on request.

EMBLEM OF INCO SERVICE
TRADE MARK

Over the years, International Nickel has accumulated a fund of useful information on the properties, treatment, fabrication and performance of engineering alloy steels, stainless steels, cast irons, brasses, bronzes, nickel silver, cupro-nickel and other alloys containing nickel. This information is yours for the asking. Write for "List A" of available publications.

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

AIR TRANSPORT

Lightplane Airlines Get Boost

CAB okays use of single-engine equipment; Central and Iowa Airplane Co. plan to start service soon.

Lightplane airlines should soon become a reality.

Two certificated but long-dormant feeders may start service with single-engine equipment this summer—Central Airlines, Oklahoma City, and Iowa Airplane Co., Des Moines.

Central is interested in using four-place Ryan Navions and Beech Bonanzas over its 1300-mile system which extends from Oklahoma into Kansas and Texas.

And Iowa Airplane Co. is reported to be considering use of four to five-place Cessna 190s or 195s on its 1259-mile system in Iowa, Minnesota, South Dakota and Nebraska.

▶ **CAB Helps**—The two carriers' plans for activating their routes with lightplanes were furthered early this month when the Civil Aeronautics Board approved the use of single-engine aircraft and small nontransport-type multi-engine aircraft for scheduled transportation of passengers under certain limitations.

The Board specified that use of such equipment in scheduled air transportation must be confined to day VFR (contact) conditions and to particular areas whose topography is favorable to single-engine operations over relatively short distances. CAB added that no instrument operations or long over-water trips would be permitted with single-engine or nontransport-type multi-engine aircraft.

▶ **Financing Difficulties**—Central was originally certificated in November, 1946, but was unable to raise money to finance conventional feeder operations with transport-type equipment such as DC-3s. Its certificate is due to expire next May barring an extension by the Board.

Iowa Airplane was selected for a certificate in December, 1946, and actually received its franchise in June of last year.

The certificate's expiration date is June, 1951.

By using lightplanes instead of transport-type equipment, Central and Iowa Airplane will be able to serve many more communities. Because of inadequate airports, Iowa Airplane would have been able to activate only two of its three route segments if it used DC-3s.

With lightplanes it can serve all 29 points.

▶ **Activation Ordered**—Both Central and Iowa Airplane were among the five feederlines which several months ago were ordered by CAB to start operations by July 1 or face Board action to cancel their certificates. Other feeders told to get started were Parks Air Lines, East St. Louis, Ill.; Arizona Airways, Phoenix; and Roscoe Turner Aeronautical Corp., Indianapolis.

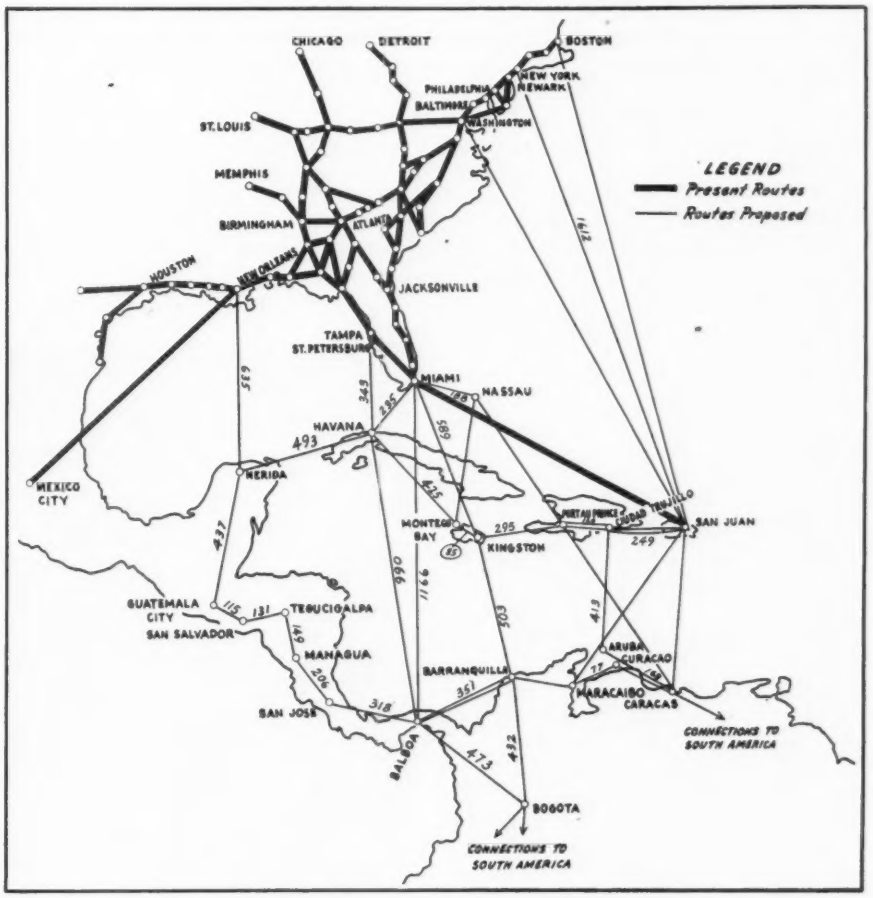
Turner plans to inaugurate service this summer with DC-3s, but probably will be unable to meet the July 1 deadline.

Turner's company has asked CAB approval to transfer its certificate from Roscoe Turner Aeronautical Corp. to Turner Airlines, Inc.

▶ **Equipment from Nonsked**—Col. Roscoe Turner, president of the aeronautical corporation, will also head the new airline company. Nationwide Air Transport Service, Inc., Miami Springs, Fla., a nonscheduled operator, is to help Turner Airlines get started.

The nonsked reportedly will furnish DC-3s and help in supplying necessary capital in addition to operating personnel.

Col. Turner told the Interstate and Foreign Commerce Committee recently that he had financing arranged for his feederline twice before, "but CAB orders (detrimental to feeder interests) had scared it off."



EASTERN AIR LINES LOOKS SOUTH

Keeping a wary eye on new threats to its connecting traffic with Latin America, Eastern Air Lines has asked the Civil Aeronautics Board to grant it a vast network of direct routes in the Caribbean area. The new links would extend EAL to 19 additional points in Central and South America and the West Indies. Eastern is fighting National Airlines' proposed equipment interchange with Pan American Airways and Panagra, alleging it will divert much of the traffic to and from Latin America which now passes over EAL's domestic routes via gateway points such as Miami, New Orleans, Brownsville and San Juan. The request for new foreign routes is seen, in part, as Eastern' answer to "a planned program" by other carriers to take away this connecting Latin American business EAL claims to have pioneered.

PO Wants Lower 'Service' Rates

Donaldson asks mail rates as low as passenger rates if subsidy, service payments are separated.

Post Office Department will call for "service" rates "at least" as low as passenger rates—if and when legislation requiring separation of service and subsidy payments to airlines is enacted.

Testifying before the Senate Interstate and Foreign Commerce Committee, Postmaster General Jesse Donaldson anticipated that this would result in a reduction of over 100 percent in department payments to carriers. (Subsidies would be paid out of Civil Aeronautics Board appropriation.)

▶ **Rate Estimates**—He estimated that passenger rates average 50 cents per ton-mile and "the department is now paying more than double that for air mail transportation." (Mail payments to the domestic trunk lines range from approximately 60 cents per ton-mile for American Airlines to approximately $21 for Northeast Airlines.)

Donaldson told the committee:

"The department holds . . . . that the mail rate, if shorn of its major subsidy elements, should not in any case be greater than the passenger rate. Passenger traffic is, beyond question, the most costly type of traffic handled by the carriers, and the only justification for a mail rate which approaches the passenger fare level is the sole factor of priority for the mail."

▶ **Final Endorsement**—Badgered by the committee's chairman, Sen. Edwin Johnson (D., Colo.), Donaldson ultimately endorsed the separation legislation. However, his prepared statement argued against it and commented that, from the view that it would reduce its deficit, "the department has no objection to the proposal."

Charles E. Beard, executive vice president of Braniff Airways, who shared the spotlight at the Senate hearings last week, took a strong stand against the legislation. He claimed that it would be "futile" to attempt to establish "fair" rates, giving consideration to the commerce and national defense value of an operation. Airlines of vital importance to the postal, national defense and commerce interests of the country, he commented, would become "the goats of subsidization" and find financing difficult.

▶ **Airlines A Bargain**—Estimating the government's outlay for the development of foreign and domestic air transportation at $107,439,430 over the past 30 years, Donaldson declared that "probably no other investment has ever returned greater national benefits in commercial and cultural progress and national security." Beard termed the commercial airline system "the greatest bargain Uncle Sam has enjoyed since the Louisiana Purchase."

Following are highlights of Donaldson's testimony before the committee.

• **Domestic Mail Profit**—Over the 1939-48 period, the Post Office made a profit of $23,282,196 on domestic air mail. It showed a "paper" profit of $19,886,620 on foreign air mail. But eliminating the war years (1943-44-45), during which the costs were borne by the military services, foreign air mail showed a deficit of $57,800,610 over the past ten years.

• **30-Year Outlook**—Over the 1918-48 period, the Post Office sustained a loss of $78,032,196 on domestic air mail and a loss of $29,407,234 on foreign air mail, or a total loss of $107,439,430. If the war years are eliminated, however, the foreign air mail loss is $107,094,464, boosting the total loss over the 30-year period to $185,126,660.

• **Big Surface Mail Subsidies**—Donaldson minimized the estimated $27 million domestic and $27 million foreign air mail subsidy for the 1948 fiscal year by comparing them with the $152 million subsidy for second-class mail, the $86 million subsidy for third-class, and the $76 million subsidy for fourth-class mail. Removing the burden of airline subsidization, he emphasized, would be only a "drop in the bucket" in wiping out the department's operating deficit of around $500 million annually.

Parcel post volume has developed "satisfactorily" but slowly because the department lacks funds with which to promote the new service with the public. Donaldson estimated that it has boosted the air mail weight by 30 percent, and that, together with the new four-cent air postcard, "may add as much a $10 million" to postal revenues for this fiscal year.

▶ **Rickenbacker Blasted**—Dubbing Eastern Air Lines' president, Eddie Rickenbacker, "the voice of monopoly," Beard denounced his proposal to take over operation of five lines (Delta, Chicago and Southern, Capital, National, Colonial) and save the government over $10 million annually in mail pay as "an affront." He drew a parallel between it and Rickenbacker's proposal prior to enactment of the 1938 CAA Act to carry mail over the San Antonio-Houston-Brownsville route "for nothing and make a profit." But even with full mail pay, Beard declared, EAL "has shown a substantial loss on this segment."

Braniff's mail pay for domestic service, Beard reported, has dropped from 25.83 cents per revenue mile in 1941 to 19.43 cents last April. The carrier's mail pay now accounts for only 15.35 percent of its total revenue, as against 34.21 percent in 1941, he said. Sen. Owen Brewster (R., Me.) commented that mail pay on Braniff's South American operations amounted to $8855 per ton-mile during the last six months of 1948.

AVIATION BUILDING

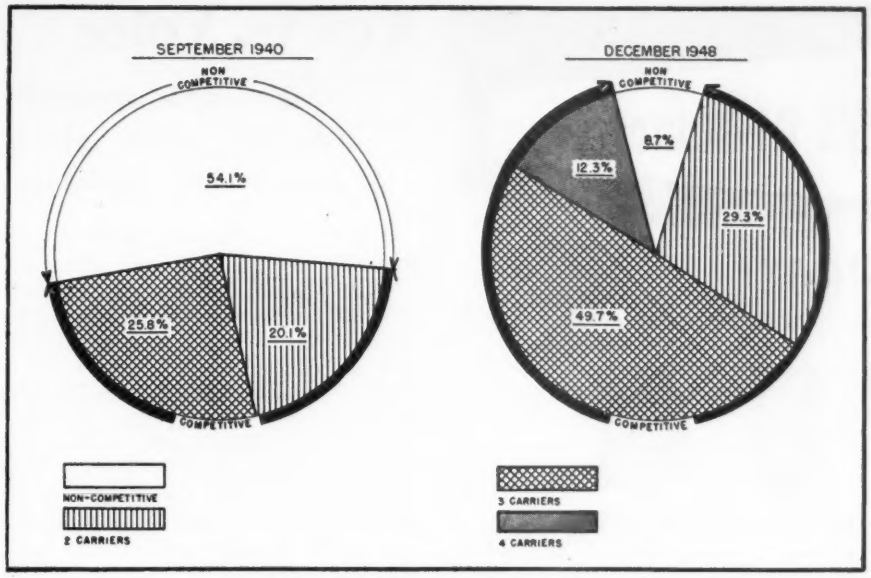
Now nearing completion, the International Aviation Building in Montreal will be ready for occupancy by ICAO, IATA and Trans-Canada Airlines by the end of July or early August. ICAO will occupy six floors in the new building; TCA will have two floors; IATA will get one. Building is located in the center of the city.

Nonskeds Hurt By Puerto Rico Crash

Congressional and public support for liberalized nonscheduled regulations wavered perceptibly this month following the crash of another plane on the bustling New York-Puerto Rico run.

Latest mishap—and the worst to date—involved a C-46 operated by Strato-Freight, Inc., of Windsor Locks, Conn., and Teterboro, N. J. Fifty-three persons were believed killed in the accident, bringing to 124 the number of fatalities suffered by irregular operators on the U. S.-Puerto Rico route in less than two years.

▶ **Preliminary Probe**—Civil Aeronautics Administration said preliminary investigation showed that the C-46, carrying 81 persons, including five in crew, was within gross load limits when it took off from the San Juan airport en route to Miami and Newark. After reaching an altitude of about 200 ft., the right engine apparently failed, and the plane



AIRLINE COMPETITION SPREADS

C. R. Smith, American Airlines president, presented these charts to the Senate Interstate and Foreign Commerce Committee recently to illustrate increased competition over principal domestic routes during the last eight years. In September, 1940, 54.1 percent of passenger mileage flown on the 50 best-traveled route segments was noncompetitive; 20.1 percent had two-carrier competition, and 25.8 percent had three-carrier competition. By the end of last year, only 8.7 percent of the passenger mileage flown on the 50 best-traveled route segments was noncompetitive; 29.3 percent had two-carrier competition; 49.7 percent had three-carrier competition, and 12.3 percent had four-carrier competition. During the four years from 1945 through 1948, CAB more than doubled the domestic airline route mileage—from about 63,000 to nearly 140,000, Smith testified before the committee.

was ditched in the ocean about five miles from the takeoff point.

While stating that early reports disclosed no evidence of overloading, CAA deputy administrator Fred Lee told the Senate Interstate and Foreign Commerce Committee that "it is not known yet whether enough safety belts were aboard." CAB Chairman Joseph O'Connell told the committee that Strato-Freight, active on the Puerto Rican run for close to two years, had made periodic reports to the Board and its three planes had always complied with regulations.

▶ **Legal Load**—CAA indicated that the C-46 which crashed was modified and overhauled in April. It was certificated to take off at 45,000 lb. gross weight, including 14,822 lb. of useful load. The plane reportedly was 500 lb. under the limit when it left San Juan.

A "semi-plush job", the craft was said to have upholstered seats down the center and bucket seats along the sides. Liability insurance totaling $100,000 reportedly was carried.

CAA declared that while the number of persons aboard appeared very high, the average weight of Puerto Ricans (who made up the entire passenger list) is only about 105 lb. About 19 of the passengers were children or infants.

▶ **Congressional Protests**—Rep. Vito Marcantonio (ALP, N. Y.), whose district contains a large number of Puerto Ricans, called for a full-dress Congressional investigation of the accident and all those involved "to prevent these crashes in the future." He charged that CAA was attempting to whitewash the mishap.

Sen. Owen Brewster (R., Me.) declared that "the problem of nonscheduled airline crashes continues to grow more serious. We may need more legislation to preserve confidence in air carriers. Mishaps involving planes carrying Puerto Ricans between San Juan, Miami and New York have created one of the most troublesome problems in civil aviation."

▶ **Hearings Scheduled**—CAB is slated to hold formal hearings on the crash shortly in Puerto Rico. Efforts are being made to raise the C-46 from 72 ft. of water so that the engines and other equipment can be examined.

Meanwhile, Puerto Rican authorities, in an effort to tighten regulations, ordered airport representatives to weigh outgoing passengers and their baggage to make sure they check with clearance figures submitted by the nonskeds. The governor of Puerto Rico also ordered nonskeds to store life preservers where they could be reached readily by passengers without expert assistance, and stipulated that each plane carry a number of life rafts.

About a half a dozen cut-rate nonskeds are flying sizeable amounts of traffic on the Puerto Rican run in competition with Pan American Airways and Eastern Air Lines. Several other irregulars participate in this business to a smaller extent.

James Fischgrund, chairman of the National Independent Air Carriers, and a frequent spokesman for the nonskeds, charged that "the scheduled airlines seek to use this tragedy to smear our entire industry."

▶ **Crashes Listed**—But the accidents on the San Juan run spoke for themselves. In July, 1947, a Burke Air transport DC-3 crashed near Melbourne, Fla., with 21 fatalities; in January, 1948, a Coastal Air Lines DC-3 mishap near Savannah, Ga., took 18 lives; and last December a DC-3 operated by Airborne Transport, Inc., disappeared between Puerto Rico and Miami with 32 persons aboard.

Thus far this year, U. S. uncertificated carriers operating on a nonscheduled or charter basis have suffered 68 passenger and crew fatalities on domestic flights and overseas runs to Alaska and Puerto Rico.

Resort Certificated For Five Years

Resort Airlines has been granted a temporary certificate by the Civil Aeronautics Board, allowing it to provide all-expense air tours between the U. S. and Mexico, the Caribbean area, South America and Canada. CAB's order was approved by President Truman.

The certificate, good for five years, specifies that not only air transportation but complete all-expense escorted tours will be offered and sold.

Routes authorized by the Board: between the co-terminal points New York, Philadelphia, Washington, Pittsburgh, Cleveland, Detroit, Chicago, Miami, and the intermediate points Mexico City; Guatemala City; Merida, Mexico; Havana, Cuba; Nassau, Bahama Islands; Ciudad Trujillo, Dominican Republic; Port-au-Prince-Cap Haitien, Haiti; San Juan, Puerto Rico; St. Thomas and St. Croix, Virgin Islands; St. Johns, Antigua, Martinique; Port-of-Spain, Trinidad; Caracas, Venezuela; Willemstad, Curacao; and Kingston-Montego Bay, Jamaica.

Also authorized: between co-terminal points New York, Philadelphia, Washington, Pittsburgh, Cleveland, Detroit, Chicago and the intermediate points Ottawa, Ontario, Montreal, St. Jovite, Mont Joli and Quebec; Moncton, New Brunswick; Charlottetown, Prince Edward Island; St. Johns, Newfoundland; Halifax and Yarmouth, Nova Scotia; and St. John, New Brunswick.

Resort Airlines has been offering all-expense tours under CAB exemptions.

Leach relays of tomorrow...

IN DESIGNS OF TODAY!

LEACH RELAY COMPANY has been in business for over 30 years designing, modifying and developing thousands of types of relays for thousands of applications. Leading civilian and military aircraft manufacturers *specify* LEACH RELAYS as standard equipment. These include AN, AAF and NAF types; also included are AAF approved substitutes for AN relays. New designs and modifications are in a constant stage of development for specific requirements.

Highest standards of engineering, materials and workmanship assure long, safe, efficient and dependable service.

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New kind of Buyer Now Dominates 4-Place Market

Surveys indicate that more and more sales in the 4-place airplane field are being made to business and professional men these days—men who haven't logged much time; and look for a rugged, safe and easy-to-fly plane.

Buyers like these are interested in a big, comfortable plane that they can fly safely themselves—and one that has maximum utility as a cargo-carrier. Many must make short or rough field landings a part of their every day flying. Small wonder then, that 1949 first quarter figures find *Ryan Navion* leading sales in its price class.

Naturally, Navion dealers are reaping increased profits from this market change.

A Ryan dealer franchise is one of the most generous in the industry. The product is backed by a unique and profitable service policy, and a hard-hitting national consumer advertising and merchandising program.

Many of these desirable dealer franchises are available to qualified businessmen. A letter of inquiry to Ryan Aeronautical Company, 406 Lindbergh Field, San Diego, Calif., will bring complete details by return mail.

(Adv.)

MORE AND MORE YOU HEAR:

Yes, more and more you hear airline purchasing agents, airport operators and private owners saying, "We're Usin' Van Dusen." They know that for 10 years Van Dusen has made it a point to handle only quality supplies at the right prices and always with prompt, friendly service.

As a result 14 major AIRLINES regularly buy a wide variety of supplies from Van Dusen at the best possible prices. Over 800 AIRPORT SERVICE OPERATORS have found Van Dusen a good outfit to deal with for all their supply needs. EXPORTERS like Van Dusen's convenient New York office and Teterboro warehouse close to New York shipping facilities for speedier handling of orders.

For all the right aircraft products at the right prices, try Van Dusen and see the difference.

Van Dusen

AIRCRAFT SUPPLIES

MINNEAPOLIS, TETERBORO, N. J.

Cable Address: VANDUSAIR, N. Y.

Key vs. Voice

CAB to hear argument whether ocean planes should carry radiomen.

The Civil Aeronautics Board is getting the hot political and economic issue of whether commercial transports used in long overwater flights should be required to carry radio telegraph operators and equipment.

Early this year, the question brought Northwest Airlines and Pan American Airways into sharp conflict with CIO and AFL communications groups. The unions charged that the carriers, in attempting to economize, were jeopardizing safety. Management replied that the unions were using "featherbedding" tactics.

Lately, the problem has shown signs of becoming a political football.

▶ **Suspension Asked**—In January, the Flight Radio Officers Air Safety Committee, representing both CIO and AFL groups, asked CAB to suspend Northwest Airlines' flights between the Pacific northwest and Honolulu until the carrier added a qualified communications officer to its crews, and installed radio telegraph equipment. According to the unions, NWA planes using only pilot-operated radio-telephones could not communicate directly with surface vessels in case of an emergency.

Northwest replied that its voice radio communications were superior to the telegraph key method, adding that the former had been approved by CAA. It said that distress messages could be sent by voice to shore stations and relayed to ships about as fast as the key communications can work directly.

▶ **Appeal to Congress**—In March, Pan American flight radio personnel, faced with the prospect of losing their $580 per month jobs to radio-telephones, asked for a Congressional investigation. Michael J. Quill, president of the Transport Workers Union of America (CIO), demanded federal legislation to require all aircraft on overwater flights to maintain radio telegraph contact on the 500 kc. international distress frequency.

The unions received encouragement last month when Sen. Edwin Johnson (D., Colo), chairman of the Senate Interstate and Foreign Commerce Committee, introduced a bill requiring all overseas aircraft to be equipped with telegraph installations (and qualified operators) capable of communicating on 500 kc.

▶ **CIO Pleased**—This legislation, the CIO declares, will implement its demand that all transocean aircraft carry

a basic operating crew of five: pilot, co-pilot, engineer, radio officer and navigator. In taking its demands to Congress, CIO condemned "the short crew policy of the overseas commercial airlines which has the cognizance of the CAB and CAA."

In announcing it would hold hearings on the controversy, CAB said the basic question is whether the ability to communicate with surface vessels on the 500 kc. frequency is necessary for survival in the event of an emergency requiring ditching of aircraft at sea, or whether the necessary communications can be handled more efficiently on appropriate route frequencies. Written briefs by interested parties must be submitted to the Board's bureau of safety regulation by July 8. For those requesting it, oral argument will be held within 30 days after filing of the briefs.

► **Specific Questions**—Among the specific questions CAB wants answered are:

- What are the probabilities of emergency conditions where the ditching of air transports at sea may be required?
- Are the time and distance factors with respect to oceanic search and rescue so critical as to require ditching of land aircraft in the near vicinity of a surface vessel?
- Assuming the answer to the previous question is affirmative, are adequate navigational means available to permit aircraft to locate and land near a surface vessel?
- What are the most efficacious means of communication to establish conditions under which an aircraft may find, and land in the vicinity of the most suitable surface vessel?

TWU Investigating Communist Activity

Michael J. Quill's Transport Workers Union of America has ordered a seven-man committee to investigate "an attempt by the Communist Party to control airline organization in the U. S. and overseas."

Specifically, the committee will look into Communist activity in the TWU air transport division, mainly in the Miami, Tulsa and New York locals, according to the union's official organ, the "TWU Express." In a resolution adopted at the recent semi-annual session of its international executive board, the union directed its committee "to investigate every phase of the Communist Party sabotage" in the air transport division. The union wants recommendations from the committee, including, "if necessary, a recommendation to reorganize the entire air transport division of TWU."

At its session, the executive board condemned the committee for airline autonomy—"an organization within the air transport division—and labeled Charles Smolikoff and Maurice Forge, "discredited union officers," as leaders of the movement. Smolikoff and Forge are officers of the Miami local, cited by the TWU Express as the "seat of the remaining left-wing disruptionists in TWU."

Philadelphia Survey

Alvin P. Adams and Associates has been selected by the city of Philadelphia to conduct an economic survey of the metropolitan district in order to determine the adequacy of Philadelphia's air transport service.

Survey will also determine the limits within which Philadelphia should confine planning for the future air terminal, in the light of possible requirements.

The Adams organization will furnish traffic and airport utilization forecasts annually through 1960.

UAL Thins Stock

United Air Lines has appointed the Moulton Co., Burbank, as consignee of a large stock of new DC-3 and DC-4 parts and equipment.

The move is expected to relieve UAL from maintaining a large sales force in order to dispose of surplus equipment.

Idlewild Range

Fire Island Lighthouse, famous as a guide to mariners, is now a navigational fix for trans-oceanic airmen.

East leg of the New York International (Idlewild) Airport radio range has been placed over the lighthouse location, where it intersects the southeast leg of the Mitchel range and the southwest leg of the MacArthur Airport radio station.

Freight Holds No Lure for Cal Eastern

California Eastern Airways, formerly one of the nation's largest all-cargo carriers, apparently has no intention of going back to the freight business in the near future.

The Oakland, Calif., company has announced its objectives are two-fold: to continue leasing its C-54s; and to prosecute its request for a certificate to operate $99 transcontinental coach-type passenger service on its own hook.

► **Financial Troubles**—CEA suspended cargo operations in May, 1948, because of financial difficulties, after flying more than 15 million freight ton miles in coast-to-coast service. Since then, it has been leasing its plants to such non-

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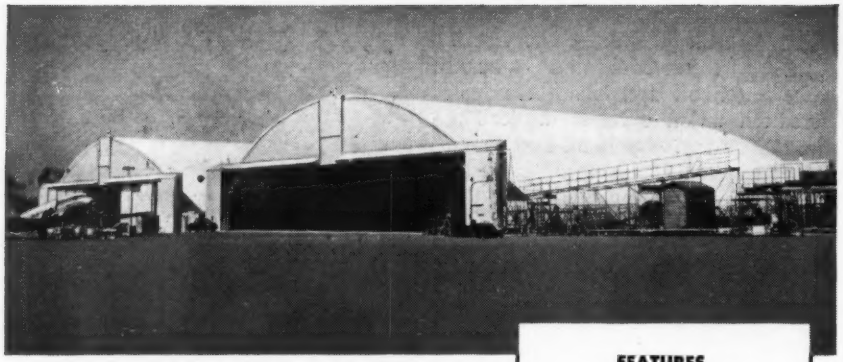

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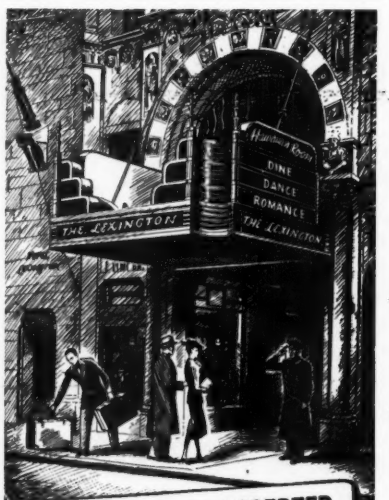

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In April of this year, the Civil Aeronautics Board issued its tentative airfreight route decision denying California Eastern an all-cargo certificate.

At a recent board of directors meeting, Andre de Saint-Phalle was renamed president and appointed treasurer. Robert E. Caskey became vice president and secretary, and Ivan O. Cooper was elected vice president-maintenance.

SHORTLINES

▶ **American**—Is distributing a new international air cargo guide covering routings to all parts of the world via more than 50 carriers.

▶ **Atlantic Airlines**—Civil Aeronautics Board has refused to take steps which would enable it to reconsider immediately Atlantic's application for a certificate to conduct coach services in the Washington-Pittsburgh-New York area. The Board's original decision in February, 1948, denying Atlantic the routes requested, is now up for review before the U. S. Court of Appeals for the District of Columbia.

▶ **Caribbean International Airways**—Has received a foreign air carrier permit from CAB authorizing nonscheduled transportation of persons, property and mail for two years between the Cayman Islands and Tampa, Fla. The British-owned islands are about 530 miles south of Tampa and 325 miles northwest of Jamaica. CIA will operate the route with an 18-passenger Consolidated PBY amphibian.

▶ **Mid-Continent**—Plans to ask CAB permission to cut fares between Kansas City, Mo., and St. Louis as much as 20 percent on a commuter, or multiride, basis, starting Aug. 1. The new tariff would provide for ticket sales in books of two or more coupons which could be used individually or by groups during a 30-day period.

Modern Air Transport—The New York nonscheduled operator has asked CAB for a certificate or exemption to carry persons, property and mail on a scheduled air coach basis between New York and San Francisco, New York and Chicago, Boston and Miami, and New York and San Juan, Puerto Rico. Company would use DC-3s, according to C. H. Smith, vice president.

▶ **Northwest**—Broke its domestic traffic record on the Friday before Memorial Day by carrying 3170 passengers. Previous peak was 2896 passengers on July 2, 1948. . . Airfreight revenues during the first four months of 1949 totaled $846,000, up 195 percent over the same period last year.

▶ **Pan American**—Employees at the be-

ginning of this year totaled 15,714. Wages and salaries for 1948 aggregate close to $60 million.

▶ **Peninsular Air Transport**—CAB has dismissed a complaint filed by six other trancontinental nonskeds against PAT's low coast-to-coast C-46 fares—$77 for "luxury" and $66 for bucket seat accommodations. Protesting carriers were Airplane Charter by Mercer, Air America, Airline Transport Carriers, Great Lakes Airlines, Viking Airlines and Standard Airlines, who feared this cut below the conventional $99 level would precipitate a rate war.

▶ **Resort Airlines**—Plans to start its fourth season of service between New York and the Saranac Lake-Lake Placid area late this month.

▶ **Trans-Canada**—Is reported by C. D. Howe, Canadian Minister of Trade and Commerce, to be looking for a new short-haul plane to replace its DC-3s.

▶ **Trans-Caribbean Air Cargo Lines**—Reports net income of $14,151 on gross revenues of $2,516,921 in 1948, compared to a $58,232 profit on $1,756,626 gross revenues in 1947.

▶ **United**—Carried over 9000 passengers the Friday before Memorial Day, breaking the previous record of 8200 set on June 19, 1948. Company flew 34 extra sections and had an overall passenger load factor of more than 85 percent for the day. . . . UAL has joined other carriers in asking CAB permission to extend the first-of-the-week family fare plan to Mar. 31, 1950.

CAB SCHEDULE

June 20—Resumption of hearings in southern transcontinental route case. (Docket 1102 et al)

June 20—Hearing on Purdue Aeronautics Corp.'s lightplane route application. (Docket 3713)

June 22—Prehearing conference in air freight rate case on accumulation, assembly and distribution tariffs. (Docket 1705 et al)

June 24—Resumption of prehearing conference in Western-Inland mail rate case. (Docket 2870 et al)

June 27—Hearing on renewal of Southwest Airways' feeder certificate and suspension of United Air Lines' service at four California points. (Docket 3718)

June 28—Hearing in Val-Air Lines and Trans-Texas Airways route case. (Dockets 3645, 3646 and 3367)

July 6—Resumption of hearings on seasonal service to Lake Tahoe. (Docket 3623)

July 18—Hearing on Mid-Continent Airlines' proposed acquisition of Parks Air Lines. (Docket 3782)

July 18—Hearing on renewal of Pioneer Air Lines' feeder certificate and suspension of service at points on routes of Braniff, Continental and American. (Docket 3719)

Aug. 8—Hearing on Carco Air Service's lightplane route application. Postponed from June 20. (Docket 3629)

Aug. 15—Hearing on Hughes Tool Co. control of TWA. Postponed from July 18. (Docket 2796)

Sept. 26—Hearing on Seaboard & Western and Transocean Air Lines applications for all-cargo certificates between the U. S. Europe and the Middle East. (Dockets 3041 and 3818)

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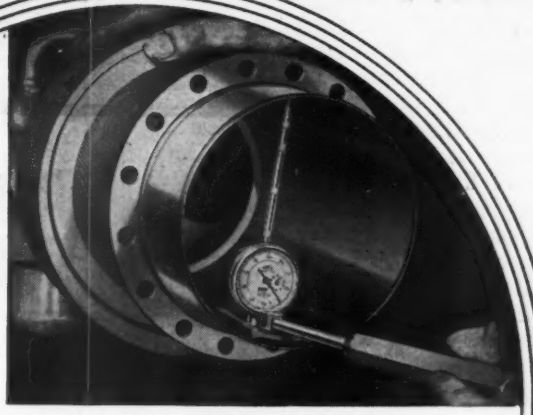

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Airfleets Hopeful

Airfleets, Inc., believes it will soon arrange to lease new transports to several domestic carriers.

W. C. Rockefeller, vice president of the firm that was organized last September as Convair Equipment Corp., said a firm proposal for financing an equipment leasing deal "probably can be submitted to the Reconstruction Finance Corp. before long." He added that while Convair-Liners will be the first transports leased by Airfleets, the company intends handling other planes.

▶ **Money Problem**—Early this year, Capital Airlines was seriously interested in leasing Convair-Liners through Airfleets. But the carrier was unable to swing the deal financially, and there have been no recent negotiations.

Most of the domestic trunklines have failed to acquire new twin-engine equipment during the postwar period. Because of financial difficulties and a willingness to see other carriers work the "bugs" out of new planes, these airlines have proved skittish as potential customers.

Airfleets is headed by Floyd B. Odlum, who is also board chairman of Consolidated Vultee Aircraft Corp.

WAL to Edmonton

Western Air Lines will inaugurate service to Edmonton, Alberta, Canada, as soon as operational details can be cleared with the Canadian Air Transport Board, according to President T. C. Drinkwater.

WAL, which has been flying as far north as Lethridge, Alberta, since 1940, was granted operating rights to Edmonton in the controversial new air transport agreement between the U. S. and Canada. CAB originally certificated Western to serve Edmonton in August, 1946. The extension will add 285 miles to WAL's system, bringing total route miles to 4898.

CAB Denies Plea

The Civil Aeronautics Board has denied the petition of Trans-Texas Airways for immediate recision of last month's order requiring the feeder to show cause why its route certificate should not expire in May, 1950.

New PAA Officers

Two new Pan American Airways vice presidents were elected by the carrier's board of directors last week. Adm. John H. Towers (USN, Ret.), becomes a vice president in the executive department, and PAA Capt. Harold E. Gray, who has been manager of the Pacific-Alaska division, is now vice president in charge of that division. Towers had been assistant vice president.

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VOICE FROM THE RUGGED WEST—Mid-Continent Airlines says their new after-midnight coach service between Twin Cities and Kansas City arouses real interest and the best example was the demand from the gent in K.C. the other day who walked up and said, "Gimme a ticket on that stage coach to Minneapolis."

* * *

PROMISING NEW MARKET FOR COPTERS—Fran Dunn, who took over **Walt Bonney's** old fort as PIO at Bell Aircraft Corp., says one of their many letters of inquiry last week was passed around to quite a few Bell people. It wanted to know about performance, speed, fuel consumption, cost and any time payment plan offered. It asked how long a warmup period was needed before takeoff and whether a Bell copter could carry two persons and 600-lb. of baggage for 1000 miles, and whether it would be affected to any degree by inclement weather. All very good questions, especially from an inmate of the Illinois State Penitentiary at Menard, Ill., because that's who wrote the letter.

* * *

WHEN'S A DC-3 NOT A DC-3?—Edward Doherty, very brash so soon after his promotion to assistant director of public relations for American Airlines (advertisement), says that airplane pictured in American's farewell to the DC-3 WAS a DC-3. Ed contends those who think otherwise must have the DT's. Purely for your own education, we quote Ed:

"TWA's sleeper version of the DC-3 was called not DTS but SDT (Sleeper Day Transport). It was distinguished from American's DST by the fact that it had four berth compartments forward and sit-up seats in the rear. The DST, which is a DC-3 sleeper type, was an all-sleeper plane. But no matter how you call it—SDT, DST, or just plain DTS, it still is a DC-3 and that's why we bade it farewell in our stage coach ad."

* * *

EVERBODY'S GETTING INTO THE ACT—Charlie Adams, our tireless Transport Editor, thinks CAB deserves sympathy just once in a while, and this is one of those times we should try to understand what it puts up with. He sends along a mimeographed very official looking thing called Order, Serial Number E-2913, duly signed by CAB's secretary, **M. C. Mulligan,** in the matter of the application of Expreso Aereo Interamericano, S. A., for amendment of a foreign air carrier permit under section 402 of the Civil Aeronautics Act of 1938, as amended. Boiled down, it decides that **Harry M. Smoker,** doing business as Smokers Garage, does not have a substantial interest in the subject matter of the proceedings and since his requested intervention "will unduly broaden the issues of the proceeding, it is ordered that the petition of Harry M. Smoker, d.b.a. Smokers Garage, for leave to intervene be and it hereby is denied."

* * *

THE STORY OF 12,000 STIFFS—You probably won't find this item anywhere else in your serious reading, so we pass along some scientific intelligence from one of those interesting Northwest Airlines press blurbs. Namely, that a party of 12,000 mosquitoes recently took a trip on NWA and didn't annoy the other passengers a bit, because they were stiff. (The mosquitoes). Says NWA: The mosquitoes, gathered in the Caribbean through the summer months, were frozen in scientific laboratories, then put in a barrel covered with dry ice and sealed tight. They were sent to the National Institute of Health Laboratories in Montana. There they will be ground up and tests made of the virus, in a research study of encephalitis. Now you New Jerseyites know what to do with your surplus skeeters, and it will help aviation, too.

* * *

A NEW MARVEL OF THE AIRLIFT—You may remember **Don Royer,** Slick Airways' former Newark station manager whose teletyped episode about selling peppers in Newark was printed here. He's on leave from Slick, on the Berlin Airlift. He asked **M. C. Wilkin,** Slick's assistant general sales manager, to tell us what he heard on the earphones:

BW 78: "Rhein Main Tower, Big Willie 78 over the range station, landing instructions, please."

Tower: "Roger, Big Willie 78 over the range. Execute a 360 deg. turn for one minute, as I have a scheduled takeoff to depart."

BW 78: "Rhein Main Tower from 78. It takes two minutes to a 360."

Tower: "Roger, 78. Do a 180 and back it in."

WHAT'S NEW

Trade Literature

"Kemp Dryers for Air, Gases and Liquids," 32-page catalog on desiccant-bed drying of air, gases and liquids, available on request to C. M. Kemp Manufacturing Co., Baltimore, Md.

"For Practical Men," a booklet on insulation resistance testing and maintenance hints, available on request to James G. Biddle Co., 1316 Arch St., Philadelphia 7, Pa.

"An Improved Model Ball Drop Sextant," by A. M. Weber, Air Navigation Devices Development Division, Civil Aeronautics Administration. Direct request to Civil Aeronautics Administratoin, Washington 25, D. C.

"Bulletin 530," covering specifications and applications of recently-developed Parker liquid level control valve, available on request to Parker Appliance Co., 17325 Euclid Ave., Cleveland.

"Design Guide," covering expansion joint selection and application, available upon request to Chicago Metal Hose Corp., Maywood, Ill.

"Air Valve Catalog," a 20-page booklet showing drawings, specifications for sizes and cutaway views, available on request to Gerotor May Corp., Baltimore 3, Md.

"Wheelco Comments," house organ of the Wheelco Instruments Co., describes different types of temperature control applications, available on request to Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.

"Aircraft and Engine Thermocouples and Accessories," a bulletin illustrating and describing most frequently used thermocouples, quick coupling connectors, terminals, lead wires and accessories, available on request to Thermo Electric Co., Fair Lawn, N. J.

"Welding Notes for Engineers," a bulletin with articles in case history style on typical problems of repair and construction, available on request to Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y.

"Welding Catalog," covering accessories, available on request to Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

"Reverse Current Cutouts," a bulletin on Hartman generator control relays, available on request to Hartman Electrical Mfg. Co., Mansfield, Ohio.

"Behr-Manning Bulletin," covering industrial grinding and finishing, available on request to Behr-Manning, Troy, N. Y.

"Silver Line," covering the Thor portable electric tools, available on request to Thor Independent Pneumatic Tool Co., Aurora, Ill.

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EDITORIAL

ATA States Its Case

(Admiral E. S. Land, President of the Air Transport Association, has answered, paragraph by paragraph, AVIATION WEEK'S editorial Apr. 25 on "Cream Skimming and Progress." We are pleased to present his complete answer. The original editorial is in roman type; the ATA's answer is in italics. RHW)

"For months the Air Transport Assn., pouting and stolid, has wailed bitterly that the nonscheduled airlines have been 'skimming the cream' of the air traffic."

Poetic or editorial license may permit such use of words as "pouting," "stolid," and "wailed bitterly." If a plain statement of facts conforms to these definitions then you may be right; otherwise, you are completely off the beam. What have the nonscheduled operators contributed to the following: operations standards, engineering standards, maintenance standards, overhaul standards, training standards, standardization of forms, standardization of procedures, accounting standards, traffic standards, etc., etc.? What have they contributed to air transport industry policies regarding: procurement, insurance, liability, communications, experience, testing, training, etc, etc.? What new planes have they purchased? If ever a group has been given a "free ride" at the overall expense of the scheduled certificated airlines, these non-scheduled operators are certainly getting the "cream."

"Now, not one nonsked that we know has charged as much fare as the scheduled carriers. So if the ATA thus admits that it knows the low-priced consumer is the 'cream' of the air travel market, would someone please come forward and explain why the scheduled carriers let someone else capture this cream first? They have been operating under the present law since 1938, and they have wide freedom in setting their own passenger rates."

Your interpretation of the word "cream" is incorrect, and so far as ATA is concerned is completely erroneous. Skimming the cream comes from illegal operations, non-compliance with regulations, serving only very high potential points with no requirements as to low potential points, with avoidance wherever possible of compliance with many requirements that are essential for the scheduled carriers. There are enclosed two pages showing the requirements of the irregular and contract operators.

"If, however, ATA means that the 'cream' is the long-haul traffic, then once again, would someone please tell us why—if they recognize the value of this long-haul carriage trade—they have not met the full demand for such service? Why has an entire new industry been able to win over thousands of transcontinental passengers in an incredibly short time, with so little promotion? Especially when these nonsked services are slower, less comfortable, without meals. Is this the cream of the traffic? The scheduled transcontinental carriers have had the wherewithal to lap up this cream but obviously have failed to do it. Why? Everything was on their side—law, experience, know-how, flying equipment, maintenance shops, sales personnel—perhaps everything but top management savy."

The answer to your first question is that the certificated airlines have met the demand to a very large and very creditable extent, and are continuing to do so as rapidly as practicable. The answer to the second question is given in the enclosed two pages which definitely show how the nonskeds can operate on a much cheaper basis when so many requirements, regulations, etc., are not complied with, thus reducing their cost. You well know the many steps that some of them have taken to short-circuit the regulations, to operate regularly although classed as irregular, various peculiar forms of advertisements, various unique ticket agencies—all of which are a matter of record before the CAB. The last statement in this paragraph is flagrantly untrue and I challenge you to prove its accuracy.

Top management of the established industry has been underestimating aviation, underestimating the airmindedness of America. Until recently, it has been more interested in keeping the subsidy spigot open than in building air transportation on sound economic lines. Top management of some of the nonskeds, scrawny but agile, have not made these mistakes. They have crept in from the other side of the tracks and lapped up this cream the fat cats haughtily scorned. The fight is on. The interlopers will probably be forced out, except for a few. Certainly, a few should be permitted to remain."

The all-inclusive statements in the first two sentences are grossly in error and their accuracy is incapable of proof. In the second half of this paragraph you are careful to differentiate by saying "some of the nonskeds." Why this differentiation?

"For the scheduled carriers, awakened by the fight, are finally making vigorous action in reducing fares, improving service, and making it difficult for CAB to perpetuate the nonskeds. And Washington talks of separating the subsidy carriers from the service compensation carriers. This is good for the industry. It will encourage more efficiency.

The first sentence is only a half-truth. As to the second sentence I thought the idea was to separate subsidy from service compensation, not separate carriers. You are expressing opinions and stating them as if they were facts.

"As AVIATION WEEK has forecast for so many months, the Congress and the public are tiring of ever rising subsidies, ever rising fares, service too often designed to meet the carriers' rather than the public's needs, while low cost operators who would offer a yardstick of competition are ground under the bureaucratic heel."

This doesn't appear to be very consistent with the previous paragraph. Airline fares are one of the few items in the cost of living which have risen only a small fraction above the pre-war level.

"The Senate's investigation into the airlines brings this judgment day much closer. So does CAB's new, stiffer policies, as bungling as several have been recently. But don't let that preliminary bungling hoodwink anyone. The trend is unmistakably toward a tougher CAB, and rightly so."

Whether the CAB is bungling or not is a matter of opinion. Again this paragraph seems to be consistently inconsistent.

"Does all of this criticism of ours appear anti-industry? Could be, if you are looking down your nose through those short-range bifocals."

The answer to your first question is yes. I am neither looking down my nose nor through short-range bifocals, but certainly your criticism, not only here but previously, has not been either fair or just.

"But AVIATION WEEK feels this way. Air transportation could become the most economical transportation in all history. Our aircraft already lead the world. Who else but America can achieve that dream of ultimate utility? Our latent air transportation potential is unbelievable. But only mass public usage will bring the maximum of peaceful, commercial achievement, and permit us to keep it."

No comment.

"Only private, competitive business will maintain the full vigor of air transportation. Government regulation and control will grow in proportion to subsidy. The trend, then, must always be away from subsidy, never toward more of it. We have the government-controlled airlines of Great Britain as the horrible example of government ownership."

No comment.

"Perhaps we shall never eliminate subsidy. But let us not wrap ourselves in camouflage and depend on the alibi that others get, or have gotten, more subsidy than the airlines."

To state facts with regard to subsidies given to other forms of transportation operated on the same principles of government regulation and control as the airlines is neither camouflage nor alibi.

"It is true that they have. But look at them. Do we envy the railroads today? If the railroads had had the gumption to modernize their rolling stocks and their rights-of-way, to speed up their service over the years, improve their schedule frequency, do you think buses and trucks would have grown at the phenomenal rate they have? We doubt it. Too many John Q. Publics got fed up with cinder showers, slow freight, infrequent trains, and a general complacent attitude of 'the public be damned'."

It is outside my province to be an advocate of the rails but this paragraph is neither fair-minded nor just nor correct, and this is particularly true in the years since the war.

"Why should aviation make the same stupid errors of its predecessors? Why can't commercial air transportation struggle like a demon to throw away the crutches of subsidy and stand on its own feet and slug it out with its competitors in the old American spirit of private enterprise, competition, and better public service?

The answer to the first question is that aviation has not made all the stupid errors of its predecessors, but being human beings, it appears inherent that some of us have to go through the fool's school of experience; therefore, some errors have been made. The answer to the second question is that what you suggest is exactly what we are trying to do. We are making real progress. It is apparently too slow to suit you but nevertheless real progress is being made. For the love of Mike give us time!

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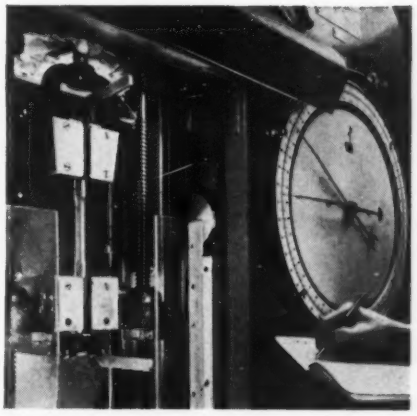

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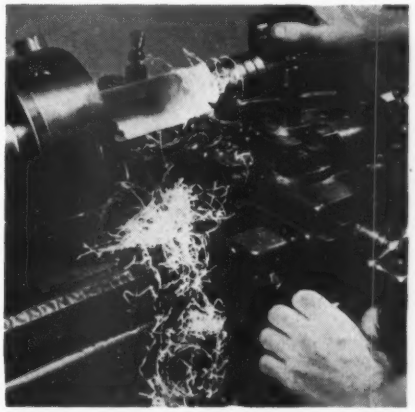

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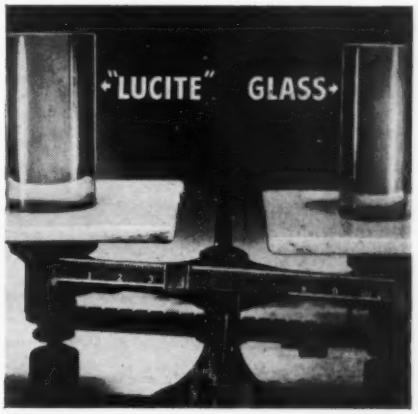

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This power supply is one of many products manufactured by General Electric for the aviation industry. G-E engineers are continually at work designing new and better products to increase efficiency and cut operating costs. Get complete information on our aviation products from your nearest G-E representative. *Apparatus Department, General Electric Company, Schenectady 5, N. Y.*

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